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The Outlook

Tudor Committee

ALL other aviation topics have given precedence to the Tudor conflict which is now being thoroughly investigated by a committee of four. The terms of reference for the committee have purposely been left as wide as possible and certainly it should be well qualified to elicit the facts and present the findings clearly and dispassionately. There is presumably no call for the committee to comment on the wisdom or otherwise of decisions made regarding the Tudors so the lack of intimate knowledge of aircraft operation or aircraft production on the part of members will be inconsequential.

It is stated that the report after submission to the Ministry of Supply will probably be made public. We trust that the term "probably" is prompted only by caution. Any suggestion of an attempt to conceal the true facts, however unpalatable, or possibly to find a scapegoat would be most damaging to the country's reputation, apart from being quite unacceptable to the tax-paying public who are concerned to the tune of £10,000,000 if in no other way.

It will be the duty of the committee to approach, among others, Lord Winster, now Governor of Cyprus. Before his untimely transfer from the Ministry of Civil Aviation, he had much to do with early Tudor decisions.

Future Employment

THE whole matter is now, in effect, *sub judice*, but on page 393 are printed the comments of the manufacturers of the Tudor and a statement by B.O.A.C. The substance of the original broadcast which touched off the present flare-up is still unconfirmed. That B.O.A.C. intend to use Tudor Is solely as freighters is hard to believe. However, it must not be forgotten that the Corporation, according to the A.V. Roe Company, have stated that they do not now intend to operate Tudor Is on their North Atlantic passenger services. It is possible that the freighter story arose from a suggestion that some Tudor VIIIs, converted Tudor Is (of which one is at present being built, and the conversion of three or four more has been advocated), might be operated experimentally on freight or mail services to gain operational experience with gas turbines. This would be a very different thing from the transformation into freighters of the whole existing fleet of Tudor I passenger aircraft, and would be in itself a desirable policy.

While our first reaction is to support the suggestion that Tudor Is should be put into operation at once as a solution to the trouble, it is obvious that such a course is not at present practicable. The Tudor was granted a provisional C of A in November, 1946, and this is still valid although the aircraft has subsequently been subject to considerable modification. It is now due to go back to Boscombe for reapproval. Until this is received, Tudors cannot be regarded as ready to commence scheduled services although some might be used for the operators' trials which must precede the proving flights.

We are less worried about the range question than certain other people who report visions of Newfoundland looming up on the horizon as the Tudor, beset by headwinds, prepares to glide gracefully into the ocean. It should not be overlooked that T.C.A. are successfully operating Canadian DC4M aircraft on ten or eleven return Atlantic services a week and that these aircraft have four engines essentially the same as those in the Tudor. The Skymaster airframe is good but definitely middle-aged and cannot be much better, if better at all, than that of the Tudor.

Another fact that must not be forgotten is that Yorks and Lancastrians are also giving very useful service on much the same engines and rather than transform Tudors for carriage of freight, if freighter be needed, it would be preferable to use Lancastrians or other such aircraft for that purpose and to replace them with Tudors which, whatever their shortcomings, offer many advantages over these worthy old bomber conversions.

Automatic Piloting

THE past week has seen unusual activity on the part of "George" and his progeny, and there has been a rather ungracious suggestion of sour grapes in the demi-official statement that we could have made an Atlantic flight, such as has just been completed by the American Skymaster, ten years ago. If a flight by a four-engined airliner made entirely without the aid of a human pilot at the controls happens to have more immediate appeal to the news sleuths of our daily Press than does a most important airborne manœuvre, that is unfortunate for the hard-working Service P.R.O.S. The situation is not, however, improved by belittling the very creditable achievement of our American colleagues.

Some people have said "so what?" to the American "pilotless" crossing. "Without aid at this end it would not have been possible, and who is going to sit on a target and home fleets of pilotless bombers?" This is not, of course, the intention at all. The flight represents a technical achievement, and is part of a development programme. Whether possible years ago or not, no one has hitherto been enterprising enough to couple up all the services as well as the primary controls of an aircraft so that it can be taken off, flown on course and, what is more important, landed safely, without the assistance of a human pilot.

So far as the principle of the Skymaster's autopilot is concerned, it is, in our opinion, outmoded. We do not in this country favour radio beams and corridor control with all their weaknesses. Instead we have developed a system of area control with the aid of pure radar. Should the need arise, we could undoubtedly equip an aircraft to fly without a pilot, and, what is more important, control it entirely from base. At present the more urgent need seems to be for a really efficient automatic pilot which will supplement the human pilots and relieve them of most of their responsibilities on long flights and on approaches to land in bad weather. In this field we had tended to fall behind America during the war, but in the last year or two we have made up the leeway, and in the instance of the new and advanced electric autopilot demonstrated at Radlett last week, we can justifiably claim to have taken a lead.

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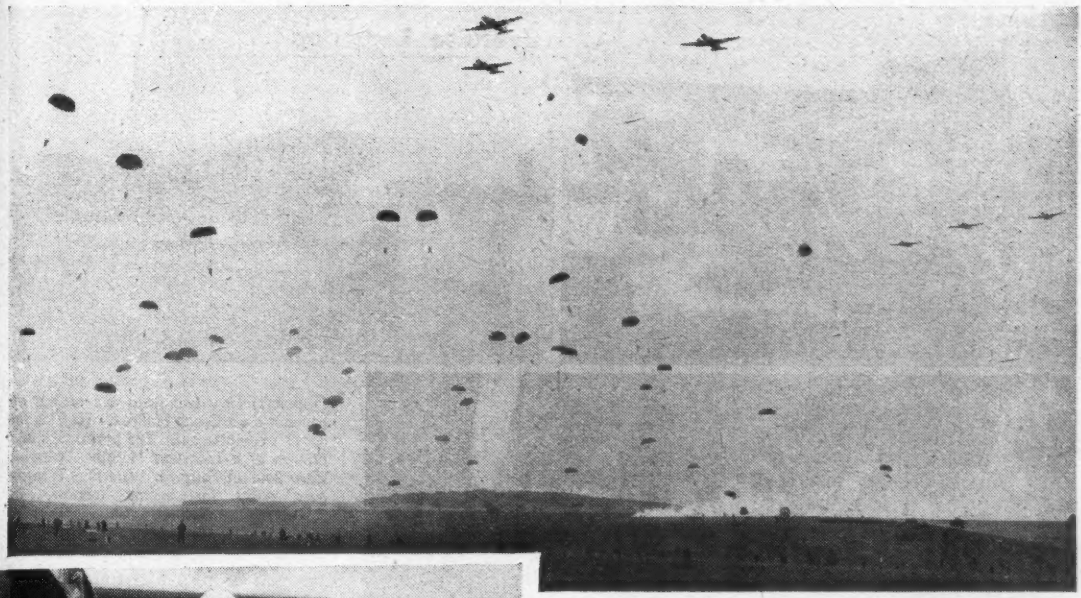
"Flight" photographs.

SCENES FROM NETHERAVON AND BRIZE NORTON: (Top left) A spare Merlin is delivered at the newly established Mobile Staging Post. (Top right) Sikorsky R-6 helicopters land staff officers in Exercise Longstop I. (Bottom left) Lord Tedder, Chief of Air Staff, Air Chief Marshal Sir Ralph Cochrane, A.O.C. in C. Transport Command, and A. V-M. A. L. Fiddament, who commanded the Transport Command Force, watch the proceedings. (Bottom right) An Avro York taxies away after being unloaded.



Paratroops of a battalion group drop from 50 Dakotas of No. 46 Group, Transport Command. (Left) Lord Tedder and Lord Montgomery watch a jeep and trailer disembark from a Horsa glider.

EXERCISE LONGSTOP

Flying Paratroops into Battle : Demonstrating a Mobile Staging Post

Illustrated by "Flight" photographs

THE combined air and army exercises held on September 23rd were the biggest to be held since the war and served to show that, despite extensive cuts in the services, we can still operate the aircraft and personnel necessary to stage an airborne operation on a considerable scale.

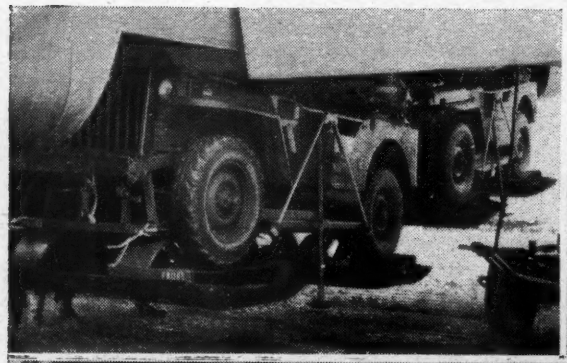
The exercise was in two distinct phases. Longstop I at Netheravon, where the tactics employed in flying a Parachute Brigade Group into battle were demonstrated, and Longstop II at Brize Norton, where the operation of an R.A.F. Mobile Staging Post and an Army Forward Air Supply Organization was shown.

Mr. Philip Noel Baker, the Air Minister, was present, together with the Chiefs of Staff. For the first phase the Transport Command force was commanded by A.V-M. A. L. Fiddament, C.B.E., D.F.C., and was composed of 12 Dakotas from No. 4 Group, 10 Halifaxes, 6 Dakotas and 9 Hamilcar gliders from No. 38 Group and 50 Dakotas and 12 Horsa gliders from No. 46 Group. The 2nd Parachute Brigade Group was under the command of Brigadier R. H. Bellamy, D.S.O.

The operation involved the flying into the battle area of approximately 2,400 men, together with 170 tons of

Aircrews of Transport Command parade at Netheravon at the conclusion of Longstop I.

Exercise Longstop . . . . .



(Top left) How two jeeps are tucked up beneath a 38 Group Halifax. (Left) S for Sugar's complement. The paratroops and aircrew of a Transport Halifax. (Above) Zero hour at Fairford. The first Halifax gets away for enemy territory at Netheravon.

equipment and supplies. The military narrative read as follows:—

> "The grass airfield at Netheravon is in enemy territory and is held by a garrison of two companies of infantry with a few obsolescent light A.A. guns. Nearest reinforcements are 40 miles away to the west, and consist of two infantry battalions, one squadron of armoured cars and one composite squadron of obsolete light and medium tanks. Communications are poor and the country undeveloped. It has been decided to seize the airfield and develop it as a Transport base."

A Battalion Group was to have been dropped the previous evening, but weather conditions were such as to render this impossible. The troops were taken by road and were in position when the exercise re-opened the next morning.

Since the whole operation lasted less than two hours, and was presented before a large crowd of service spectators, it bore the stamp of the parade ground rather than the battlefield, and with parade ground precision it was carried out.

At 10.30 a.m. precisely, the Dakotas of No. 46 Group arrived over the airfield with the second Battalion Group of paratroops, and soon the air was filled with the billowing silk of parachutes. The wind was in the region of 18-20 m.p.h., which is about the limit for paratroop operations, but, despite this comparatively high wind, only nine out of the hundreds of troops who dropped sustained any injury and none was seriously hurt.

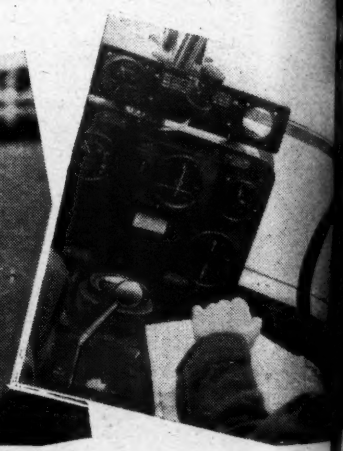
Next to arrive, ten minutes later, were 10 Halifaxes of No. 38 Group. These came from Fairford and had guns and jeeps slung underneath, and their teams inside the fuselage. Each gun or jeep had four chutes to support it, and the teams jumped at the same time.

A new feature of the exercise was the arrival of airfield construction equipment in towed gliders—12 Horsas and 9 Hamilcars. This is best described by a member of *Flight* staff who travelled in one of the Horsas. His account follows:—

Journey by Horsa

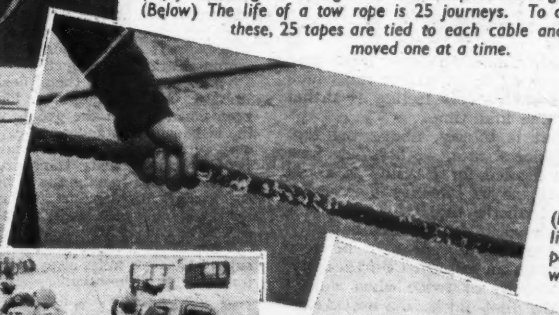
"INSTRUCTIONS to report to Fairford airfield brought back a flood of memories. Three years ago, almost to a day, I had reported there to go on the Arnhem operation. Now, however, we were only playing at war, and the camp was not sealed as it was on that famous occasion. Neither was there any Sten-armed corporal to escort me to the station adjutant. The "Flying Horse," in other words the officers' mess bar, was unchanged, but one could but wonder what had happened to all the good chaps who gathered there on the night before Arnhem. Many, of course, fell on that unfortunate battlefield, others are now dispersed the world over.

On the airfield the Horsas stood in a square block at the end of the same runway as they did on that memorable day, but there the likeness ended. Dakotas and Halifaxes took the place of Stirlings; there was no crowd of W.A.A.F.s with an air of forced gaiety to see us off, nor the padre having a word here and there with the chaps. At 9.40 a.m. engines began to warm up and shortly afterwards the Halifaxes, which were dropping guns and jeeps by parachute, took off at 40-second intervals.

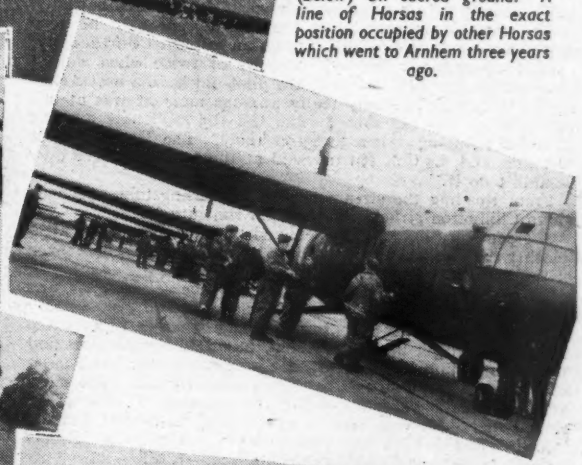


Not the D.Z. at Arnhem but a glider dump on the edge of Netheravon airfield.

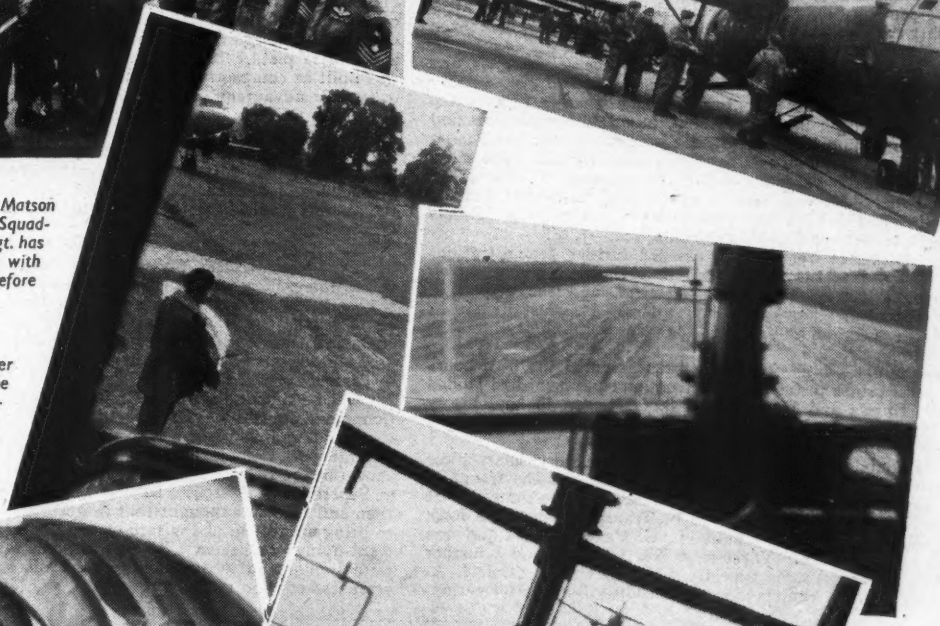
(Left) Attaching the towing cable to an Airspeed Horsa glider. (Below) The life of a tow rope is 25 journeys. To check these, 25 tapes are tied to each cable and removed one at a time.



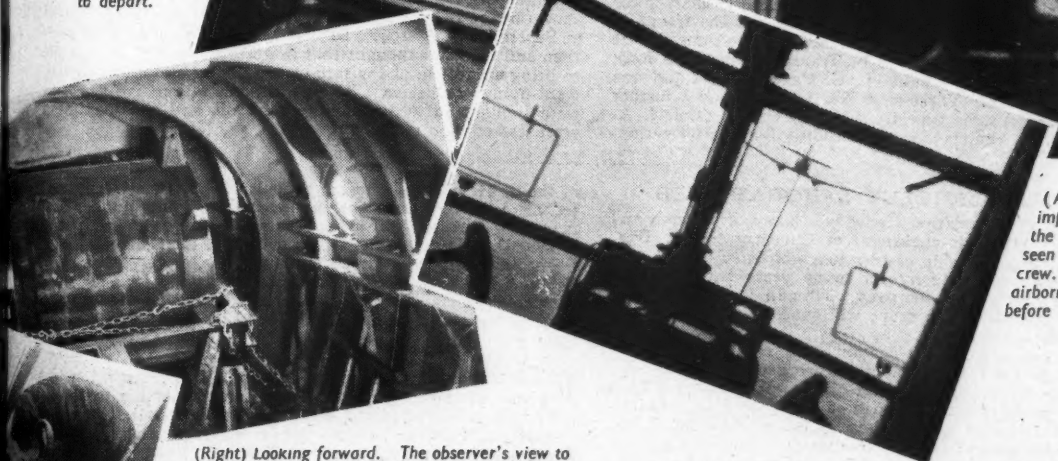
(Below) On sacred ground. A line of Horsas in the exact position occupied by other Horsas which went to Arnhem three years ago.



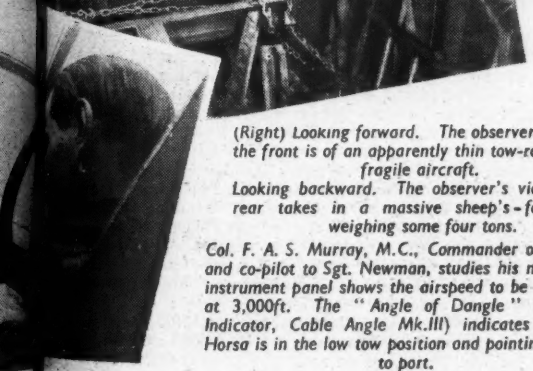
Sgt. Major E. Matson (with stick) of N Squadron, Glider Pilot Regt. has a few last words with his N.C.O. pilots before take-off.



The control officer flag signals to the tug aircraft to take-off. On the left is the Dakota next to depart.



(Above) An impression of the take-off as seen by the glider crew. The Horsa is airborne some while before the Dakota.



(Right) Looking forward. The observer's view to the front is of an apparently thin tow-rope and a fragile aircraft.
Looking backward. The observer's view to the rear takes in a massive sheep's-foot roller weighing some four tons.

Col. F. A. S. Murray, M.C., Commander of the unit and co-pilot to Sgt. Newman, studies his map. The instrument panel shows the airspeed to be 105 knots at 3,000ft. The "Angle of Dangle" clock (or Indicator, Cable Angle Mk.III) indicates that the Horsa is in the low tow position and pointing slightly to port.

As the last Halifax got away, the first Dakota glider tug moved into position, from the side to the front of its Horsa. A flag signal from the control officer and the tug tightened the tow line and then away down the runway went the pair.

The gliders also got away at 40-second intervals, and quickly my turn came on the last but one glider to go. As first pilot, Staff Sgt. Newman was on board, but as co-pilot there was Col. Murray, who commanded N and D Squadrons of the Glider Pilot Regiment. The Horsa's load was a massive sheep's-foot roller, which one prayed would not break adrift from its lashings and overrun both passenger and crew. At the proper time our Dakota tug moved up in front, but there was

Exercise Longstop . . . . .

no jerk as the tow-rope tightened. Almost before one realized it the glider was unstuck and looking down on the tug which was still struggling to get airborne. This feeling is rather uncanny when experienced for the first time.

Keeping in the high-tow (that is to say, above the tug) position until we got into the glider stream, we first flew west to adjust our timing, and then headed for Reading at about 2,500 feet. Orders insisted that in the stream we must fly in the low-tow (at a lower level than the tug) position. I now know exactly how a minnow feels when used as live bait.

The control movements on the Horsa appear to be very coarse by comparison with those on an aircraft. Fortunately, conditions were not bumpy, but once or twice when we got into bad patches of slipstream, the pilot did have a hectic time trying to cope. The only really anxious moment was at one period when our tug slowed from the 105-110 knots cruising it had been doing down to 85-90 knots. The Horsa did not like that and, as Col. Murray said at the time, "I wish they wouldn't do it."

From Reading the stream headed for Basingstoke and then on to Chilbolton airfield for the final run into Netheravon.

A green Very light gave the signal for release, and one after another the Horsas substituted gravity as a power unit in place of the two Pratt and Whitneys of each Dakota.

Coming over the edge of Netheravon, the scene below was most realistic. A dump of wrecked gliders looked uncommonly like a wartime D.Z From our approach it seemed impossible that we could get into the airfield, but Sgt. Newman assured me that it would be all right. He proved correct, but I must add that the full-flap, nearly vertical, descent did make me a little anxious once more about the moorings of the roller behind me. All was well, however, and on arrival I made myself scarce whilst the process of unloading the gliders through their hinged noses went on apace.—J. Y.

As the gliders were being unloaded further demonstrations took place—the snatch take-off of a Hadrian glider, which supposedly carried important prisoners, and the arrival of staff officers in Sikorsky R6 helicopters. This last item took place in very close—almost too close—proximity to the spectators.

Five minutes later (it having been assumed the 8-12 hours had passed since the airfield construction equipment had landed in the Horsas and Hamilcars) Dakotas began to land heavy equipment for the third Battalion Group, which was also flown in by Dakotas during the next half-hour.

This completed Longstop I, which was a very smart piece of battle drill by both Transport Command and the troops.

Longstop II took place in the afternoon of the same day at Brize Norton airfield. The R.A.F. Transport Command force was commanded by Air Cmdre. L. G. Harvey, C.B., and was made up of five Avro Yorks from No. 4 Group, and a further 15 aircraft of the same type from No. 47 Group. Col. J. A. Dawson C.B.E., commanded the Airborne Transport Development Centre, which was responsible for the army side of the picture. The narrative read:—

"Brize Norton is an airfield after its capture, with runways intact, apart from minor damage, but all buildings and internal communications destroyed

"Since its capture, the airfield has been developed to receive York aircraft. All the equipment for the Staging Post and F.A.S.O. has been flown in and the events which take place show the arrival of the last loads of staging-post equipment, and their erection, together with typical reinforcement loads for units in the field.

"For high-intensity transport operation, standard loads are desirable if speed in handling is to be attained. This afternoon, however, the token loads demonstrated are varied, being equipment required for the staging post itself, together with the first loads for the Army F.A.S.O. and R.A.F operational units.

"The York aircraft are assumed to be operating from their main supply base 500 miles away. They can therefore carry sufficient fuel for the return journey."

A staging post has a multitudinous variety of duties and responsibilities; it receives and distributes equipment; feeds passengers and crews; attends to the wounded; repairs aircraft and controls their movements. In addition to all its military requirements it must carry all the paraphernalia of a civil airport, yet all its equipment—from meteorological section to a light airfield construction unit—must be of a type able to be flown into any captured or newly made airfield.

Again, as in Longstop I, the parade-ground atmosphere ousted that of the battle ground and, in this instance, time and space were again contributory causes. In order to present a complete picture to the spectators the tented staging post was built as compactly as possible, and to show the unloading to its best advantage the Yorks were taxied, six at a time, to disembark their contents in front of the enclosures.

Even so the timing appeared to be a trifle optimistic, and later aircraft had to keep their engines ticking over for a considerable period before the aircraft in front of them had unloaded and cleared. Under Service conditions, of course, the aircraft would have been dispersed and all unloaded simultaneously.

The afternoon did, however, serve to show what a good transport aircraft the York makes. Its high-wing arrangement and square-section fuselage gives a good low-loading entrance and the door itself is of ample dimensions. This was emphasized when a jeep, anti-tank gun and trailer were disembarked from one York in less than five minutes.

At the close of the proceedings a very select party, headed by Marshal of the Royal Air Force Lord Tedder, was taken by Air Chief Marshal Sir Ralph Cochrane, A.O.C. in C Transport Command, to Flying Control to watch a demonstration of the rapid-landing system evolved by the research department of Transport Command H.Q. This is the system which was shown before I.C.A.O. at Bassingbourn and described in *Flight* on September 19th, 1946. Development work has gone on since then and it is now thought that in operation it will be possible to bring aircraft in at the rate of one per minute under instrument-flying conditions At this demonstration five Dakotas were brought in at two-minute intervals and the maximum error was only 40 seconds.

TILTMAN-LANGLEY LABORATORIES

MANY people in aviation circles will know of Tiltman and Langley, research engineers, of Coventry Street, W.1. This successful partnership of two men who have been closely associated with the industry for many years has now been transformed into a new company. Tiltman Langley Laboratories, Ltd., and its wider scope will enable a greater volume of work to be tackled.

The new company, which has an initial capital of £10,000, will take over the major part of the work of the partnership but will also expand in several directions. A hangar has been taken at Redhill airfield which will be used to provide administration and technical offices, drawing office, mechanical test house and workshops, and the company's principal work will be the carrying out of research and development under contracts from the Ministry of Supply and the Royal Aircraft Establishment at Farnborough. In addition consultative services on technical matters have been undertaken for important operators and manufacturing firms, but it is not proposed to enter into the subsequent production or commercial exploitation of any aircraft, accessories, or equipment which may be developed.

The directors of the company are Mr. C. H. Roberts, chairman, and principal and founder of the Chelsea College of Aeronautical Engineering; Mr. Marcus Langley, managing director, previously chief engineer of Flight Refuelling, Ltd., and earlier of the British Aircraft Manufacturing Co., Ltd., at Hanworth, and, incidentally, first instructor in aircraft design of the de Havilland Technical School; Mr. A. Hessell Tiltman, technical director, and best known as the joint founder and managing director for many years of Airspeed, Ltd.; and Mr. G. D. Duguid, M.A., senior master of the College.

The chief engineer of the company will be Mr. J. J. Gerrisene, B.Sc., A.F.R.Ae.S., a South African associated with the earlier partnership and who previously worked with Mr. Langley as chief technician of Flight Refuelling, Ltd.

PERUVIAN AIR FORCE DAY

IN celebration of the Peruvian Air Force Day a reception was given at the Dorchester Hotel on September 24th by Commander Manuel P. Garcia, air attaché to the Peruvian Embassy. Over a hundred guests were present, including Foreign Air Attachés, representatives of Ministries, Services and industry.

The Peruvian Air Force celebrates its day of institution, September 3rd, 1910, and commemorates the fine pioneer flight over the Simplon Pass by George Chavez. Looking back in *Flight* of October 1st, 1910, we read about this praiseworthy crossing which gave first impetus to Peruvian wings and learn of the unfortunate accident, attributed to the intense cold, which resulted in Chavez crash landing after his flight and meeting his death a day or two later.

Peru now has some 500 military aircraft, including trainers, P-40s and P-47s, and various Douglas, Lockheed and Vultee types are included in its equipment. The present Commander-in-Chief is General Silva G. Ergasto

S.E.P.1 in the Air

The First British Electric Automatic Pilot in Operation : Convincing Demonstration of New Technique

FROM a combination of long experience in the manufacture of automatic pilots, observation both of the operation and latest developments in other types and determination to take fullest advantage of the vast electric field, Smiths Aircraft Instruments Ltd. have produced the S.E.P.1, technical details of which were described in last week's *Flight*. Later in the week we had the opportunity of trying it out in the air. A Lancaster from the R.A.E. Farnborough, fitted with the Smith Electric Pilot—actually one of the aircraft which has been used for development of the equipment—was demonstrated by S/L. Adderley, who has been closely connected with its progress.

On entering the cockpit and examining the controls one was immediately impressed by their extreme simplicity and the absence of indicators for lining-up, and it must be admitted that one found it difficult to understand at first how, in fact, the automatic pilot did take over. Such a reaction was understandable to one associated for many years with American equipment. However, the initial engagement was so smooth, effortless and completely convincing that one realised immediately that this was a "George" with a difference.

The switch unit and pilot's controller were illustrated in last week's issue of *Flight* and consist of two separate units, one containing the engagement switches and the other the single control knob or "stick." If necessary, a duplicate set may be installed for the second pilot, in which case the system may be so arranged as to render the second pilot's controller inoperative when the captain's controller is in use and, additionally, so that control may be transferred from one unit to the other without disengaging the automatic pilot. B.O.A.C. have asked for the two units to be incorporated into a single unit suitable for installation upon a normal central pedestal.

The S.E.P.1 was first of all engaged with the Lancaster in normal straight and level flight after each control had been trimmed. The take-over was completed without any sign of snatch, as may perhaps reasonably be expected, and level flight was maintained both directionally and laterally and, after slight trimming, also in pitch. Having set the aircraft in this attitude any effect of fore and aft movement in the cabin by passengers, was controlled, and no change was registered in the flying attitude of the aircraft.

Level Flight Maintained

To revert for a moment to the engagement—which was so simple and smooth that it was apt to pass unnoticed—the first action was to close the main switch on the swich unit; this caused the gyros to be speeded-up and the amplifier to become warmed. Only 45 seconds were required, which is probably the normal time taken for trimming controls. When ready, an amber light appeared on the switch box and all that remained to be done to cause the automatic pilot to take over was for the human pilot to press the engaging button on the switch box. Having handed over control to the S.E.P.1 all desired premeditated change in attitude was obtained through the controller "stick." Desired and premeditated is deliberately used since it must be appreciated that the S.E.P.1 is designed to maintain the aircraft on a level plane about the directional and lateral axes and any adjustments about those axes are normally made to alter the attitude rather than, as heretofore, to correct an undesirable or unnatural attitude. Admittedly other automatic pilots are used for changes in direction or altitude, but invariably the greatest use to which they are put is for corrective purposes. An illustration of this was made by engaging at altitudes of unlevel flight. For example, when the button was pressed whilst in a climbing turn, the aircraft continued flight in the direction at the time of engagement and at the same rate of climb, it did however assume, very gently, level lateral flight.

The pilot's controller has a single knob which is positively spring-centred, both in rotation and in fore and aft movement and which, in order to safeguard against accidental operation, only operates the equipment when depressed. Having demonstrated the faultless way in which the automatic pilot maintained level flight, we proceeded to execute various manœuvres. Incidentally, owing to the clear weather on the day of the demonstration we were unable to experience automatic flight in rough air; it is understood, however, that during tests in extremely turbulent conditions, the S.E.P.1 behaved perfectly, maintaining gently controlled, steady flight, and exerting no dangerous strain upon the control surfaces or the main structure.

After depressing the knob, only slight pressure was required to move the control "stick" backwards or forwards to climb or dive, or in rotation to make a perfectly banked turn in either direction. The amount of travel imposed, from the self-centred position, determined the rate of climb or dive or the rate of turn, and when the stick was released the aircraft continued flight in a level lateral altitude in the direction at the time of release, and at the rate of climb or dive at the time of release.

Reaction To Emergency

Climbing and diving was straightforward, and so, in fact, were turns in both directions; there was, however, a slight tendency for the nose to rise to a rate of climb approaching 300 ft/min after coming out of a turn banked greater than 30 degrees. It is possible that the aircraft was trimmed slightly nose up as turns at a lesser rate were completed without any variation in height. Since most turns were made through an arc of about 90 degrees, no importance need be attached to the tendency. During normal level flight an engine was throttled back and the airscrew feathered; the immediate reaction was for the aircraft to swing off course about eight degrees, and had it been left it would slowly have been automatically pulled back on to course. The correct action in such circumstances was, however, taken, pressure on the rudder was exercised by the pilot, the rudder servo was switched off at the switch box, the rudder tab was retrimmed, and the rudder servo was then re-engaged. It would be as well to mention at this stage that manual control about any axis can be resumed by switching off the appropriate servo.

In reply to some rather natural questions, which must for obvious reasons be accepted, it was understood that this automatic pilot cannot be over-ridden and the aircraft controlled manually, as on some earlier types. This does not constitute a danger, however, since there are three methods of breaking the electric current and so disengaging in an emergency. If one of the servos ceases to function properly or if there is any breakdown in any circuit, there would not be any violent reaction, but the control in question would merely become sloppy. In any case, due precaution has been taken by the designers to avoid failures; for example, the rate/rate control system eliminates the danger from toppling gyros and the need for caging mechanisms; limit switches and angular accelerometers are unnecessary since safety circuits preclude the possibility of runaway servo-motors; an automatic cut-out disengages the automatic pilot in the event of voltage irregularities and gyro/servo signal alignment is automatic.

To judge reliability at this stage is perhaps presumptuous, but suffice it to say that aircraft of R.A.F. Transport Command fitted with the S.E.P.1 have made fourteen flights to Singapore and back, under observation, and no trouble or unserviceability has been experienced.

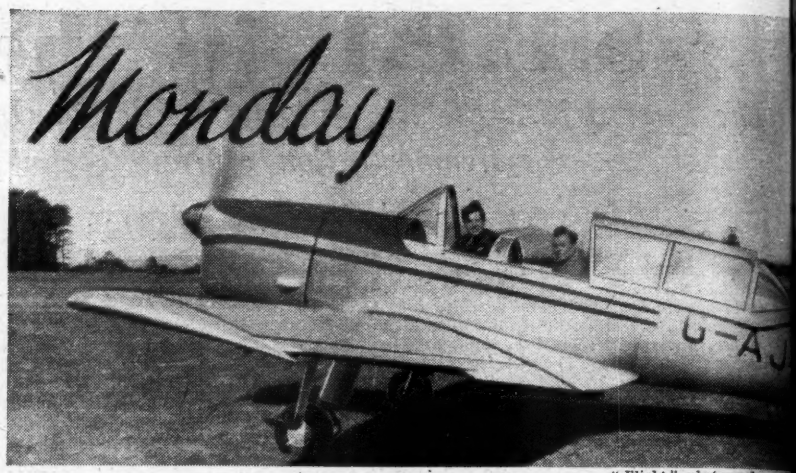
Maintenance problems have been studied and the entire installation is constructed on a unit replacement system, each unit being quickly detachable and replaceable. Such servicing is necessary only after 1,000 hours' service or after a breakdown. For this latter purpose a special portable test set has been developed for the detection of unserviceable units.

Weighing slightly less than 100lb, the British designed and produced S.E.P.1 is, on experience, a first-class automatic pilot, simple in control, efficient, smooth and effortless, but positive in operation. In character it is quite different from any previous models, and on reported test it is reliable and easy to maintain.

Handley Page, Ltd., are the first British aircraft manufacturers officially to adopt the pilot, and it was, aptly, from Radlett that the recent demonstration took place. At a reception the same evening Sir Allan Gordon-Smith, chairman of S. Smith and Sons, Ltd., presented a Smith gold watch to Mr. F. W. Meredith in recognition of his work in developing this first-class autopilot, and congratulated him and his team on the success of the project.

Back on Monday

Getting to Know the Chipmunk : R.A.F. Stations, Henlow, Marham and Cranwell "At Home" : Opening Butlin's Pwllheli Airfield



"Flight" photograph.

Mr. W. E. Butlin, attracted by the D.H. Chipmunk, was anxious to experience its performance in the air. This first wholly de Havilland of Canada design was of particular interest to Mr. Butlin who, though born in South Africa, was brought up in Canada.

By W/C. MAURICE A. SMITH, D.F.C.

IT had been obvious for some time that the week-end of September 20th-21st was going to be a very busy one. Had it been possible I should like to have visited each of the seventy-odd R.A.F. stations "at home" to the public in recognition of Battle of Britain week, but in addition the guest week-end organized by Mr. Butlin at his camp at Pwllheli in North Wales promised to be both enjoyable and interesting. As things turned out I managed to see a little of everything and to enjoy myself thoroughly in the process. Instead of writing individual descriptions of airfields and programmes I have decided to offer the account as a personal diary. To a great extent the "round up" of stations was made possible by de Havilland's, who provided one of their much-sought-after Chipmunks as transport. Quite early in the week-end, as a result of the great interest shown in this attractive little trainer, I decided that a suitable slogan would be "fly a Chipmunk and feel important."

On Friday afternoon it seemed that all the planning might be in vain; Hatfield reported a clamp. Almost miraculously, however, conditions improved and by 5 o'clock visibility was two to three miles and I was able to take-off on a positioning flight to Fair Oaks, my home airfield, to prepare for an early start on the following morning.

Some weeks ago I had flown the Chipmunk for about an hour and it did not take long to confirm my first assessment that it is an exceptionally pleasant little aircraft to fly. The example I borrowed had a Gipsy Major IC engine and wooden airscrew, and was fitted with Canadian-style instrument panel. One on R.A.F. trials with Service-type panel and V.H.F. radio has a Gipsy Major 10 and metal airscrew. With Major IC engine, the cruising speed was about 110 m.p.h. indicated and 130 m.p.h. was the maximum. In view of the excellent take-off and climb performance and the tendency to over-rev by as much as 200 r.p.m. in all-out level flight I decided that a coarser pitch airscrew could be fitted with advantage for cross-country work.

On Saturday morning bright sunshine favoured our take-off—my wife now occupied the rear cockpit—and Henlow, first station to be visited, was reached uneventfully on E.T.A. In contrast to the flight from Hatfield on the previous evening the visibility was perfect, and whereas in the first place I had strained my eyes peering downwards to make sure no landmark was missed, London was now spread out like a map with the enormous runways at London Airport seeming to reach out to the horizons and the belt of airfields, Northolt, Heston, Denham, Hendon, Elstree, Radlett, Hatfield, Luton appearing almost to overlap.

Henlow

Henlow had arranged a particularly interesting display of which the static exhibition was a strong feature. The station will in future be a training unit for various trades including fitters A and E and to the armament section has recently been added a guided missile division. The public were able to examine a V1, a Baka Jap suicide machine, a Fritz X guided anti-ship bomb and others, including air and ground launched guided rocket A.A. missiles such as the X4, Fuerlilie and Rheintochter. In the engine section were several British units and a sectioned Jumo 004 jet unit. The flying programme included a single-engine demonstration on a Mosquito by F/O. Thomas, Halifax and Dakota supply dropping, fighter attacks by a Spitfire on a Halifax, following aerobatics by the Spit (pilot F/L. Dodds), also demonstrations by F/L. Beecroft in a Feiseler Storch and G/C. Walker in an antique Sopwith "Pup."

We were due at the Central Bomber Establishment at Marham, Norfolk, for lunch and again the flight was made according to plan. The track

It was no mean feat to prepare the Butlin Broom Hall airfield near Pwllheli, but the grass runways are now quite suitable for such aircraft as the Proctor and Consol. Some 38 visiting aircraft arrived for the opening ceremony.

Prizes for the concours d'élégance were presented by Mrs. W. E. Butlin. On the right is the winning American Navion entered by Mrs. Ackerman. (Above) Flight's representative is congratulated on the good looks of the Chipmunk. (Top right) Col. Price-White, M.P., who performed the opening ceremony.

lay almost over the top of Ely Cathedral which looked as fine from the air as it does from the ground. Many of the well-known bomber stations were seen below. Most of them are deserted and some are now under the plough and recognizable only by their runways and buildings.

Marham

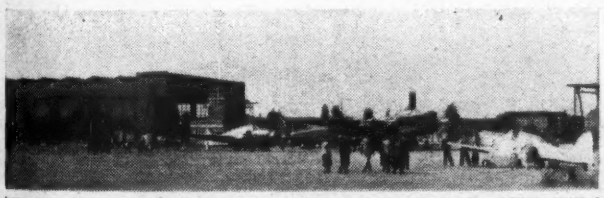
Marham is a fine station with very long, wide runways of the latest type. Like many of the other stations its flying programme was part local and part by arrangement at Command level. During the afternoon, formations of Meteors, Lincolns (from Marham) and other operational types flew over a number of stations as part of a training exercise and, in between times, the home squadron or individual pilots gave displays. Of special interest was an attack on a set piece marked by a Mosquito using the dive-bombing technique. The pilot, S/L. C. B. Owen, D.S.O., D.F.C., was one who helped to develop this method of night marking during the war. By this time the Chipmunk had inspired me with sufficient confidence to accept an invitation to put it through its paces as an additional item on Marham's programme. Joy-riding (in a Rapide and a Proctor in this instance) was also a popular sideline at most "at home" stations.

Cranwell

From Marham we flew to Cranwell. I know of no more imposing building than the Royal Air Force College, and on this Saturday afternoon it was looking its best. The Chipmunk received a somewhat puzzling reception on the circuit. Coloured Very lights giving all known signals were followed by smoke puffs and rockets bursting beside us. We completed three circuits while deciding which of the two fields to land on and whether in fact we were being warned off or were witnessing a pyrotechnic display.

Cranwell's flying programme included dive-bombing by Harvards, a fly-past by a Meteor III and glider aerobatics. German aircraft were also exhibited in one of the hangars, and a water polo match, P.T. display and flying by model aircraft provided additional entertainment.

Allowing comfortable time to reach Pwllheli (one gets by with a noise spelt *Pworthelly*) before dark we set course westwards after the Cranwell flying programme had ended. The Chipmunk continued to fly faultlessly, unperturbed by a second removal of passenger and luggage to permit a few minutes' strenuous aerobatics at Cranwell. My passenger



Two R.A.F. stations which were typical of the 70 which were "at home" to the public on Saturday, September 20th. (Top) Central Bomber Establishment at Marham, which provided in particular a flight of Lincolns, and (below) the Chipmunk at Cranwell, home of the Royal Air Force College.

One of the special exhibits at Henlow was the Sopwith Pup, which contrasted with the last-war fighters and bombers and the post-war Chipmunk in the foreground. This station will soon devote its energies entirely to technical ground training.

Back on Monday . . . . .

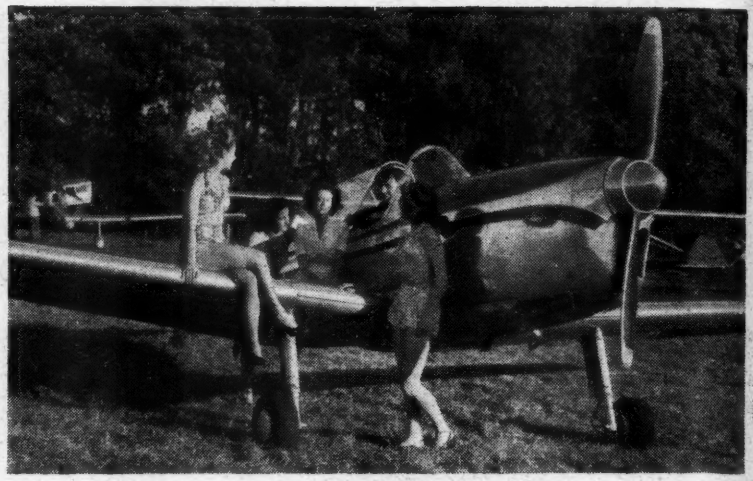
flew while I read maps, across England to the Welsh hills and here a decision had to be taken. To the South was a large and turbulent-looking storm area and ahead were thick clouds obscuring the mountain tops. It might have been possible to weave our way up the valleys below cloud but I decided on the strength of a good weather report on the coast and rapidly setting sun to go up and over. Rising air helped to carry us up to almost 7,000 feet in a very short time, and in spite of the dazzling brightness of the sun and its reflection from the towering cumulus clouds, the remote grandeur of the scene was such that words would be quite inadequate to describe it. One or two small gaps in the cloud exposed to view the rounded mountain tops and the tiny threads and patches of silver which were the rivers and lakes in the valleys far below. How small and frail the Chipmunk seemed among such vastness.

The twenty or so minutes above cloud seemed more like an hour to me. One engine over cloud-obscured peaks and no parachutes, though quite a normal risk, cannot ever be a comfortable combination. However, as predicted, cloud ceased abruptly at the coast and almost the whole of Caernarvon Bay could be seen twinkling below with the grey lumps of St. Tudwalls and Bardsey Islands dotted around the peninsula of Caernarvon and the Menai Strait severing Anglesey in the North.

We found the little Broom Hall airfield a mile or two short of Pwllheli town, and after summing up its diminutive grass runways dropped in down sun, in still air, with plenty of room to spare. We were quickly guided to our parking space, numbered and tied down, all as we were later to discover with characteristic Butlin thoroughness and efficiency. Equally quickly we were transported to the camp a mile or two away, registered, issued with chalet keys, badges and programme, fed and taken to the neon-illuminated bar. Here we caught up with ourselves and tried to catch up with our fellow campers.

The ramifications of Mr. Butlin's organization and the details of camp facilities and life could only be outlined if my whole narrative were devoted to the subject. It must suffice here to say that the flying visitors were unanimous in their praise of what they saw and experienced, and in agreeing that they had been well looked after and had had a thoroughly good time. To many of us, at least, the week-end holiday offset the unfortunate impressions of holiday camps which have been created by films and picture stories.

On Sunday the opening ceremony for Butlin's Broom Hall, Pwllheli, airfield was performed by Col. Price-White, M.P., a most appropriate choice in view of his keen interest in aviation matters and his determination to put Wales, particularly North Wales, on the civil air map.



It was the Chipmunk which won a prize for elegance. The escorting Butlin staff "red coats" are, on this occasion, gilding the lily.

For our hosts Major Bond introduced Mr. Butlin who announced his welcome intention of holding more air meetings next year at the airfields attached to his other camps, adding that he considered that this first experiment had proved a success as witnessed by the fact that the campers welcomed the air visitors. Shortly before the ceremony was due to begin *Flight* was accorded the honour of addressing the crowd on behalf of the air party and of thanking Col. Price-White—an honour duly appreciated, but responsible also for the complete removal of appetite for lunch from *Flight's* previously hungry representative!

During the afternoon a *concours d'élégance* was held in which campers chose the three most elegant aircraft. A well-justified win was gained by the Navion entered by Col. and Mrs. Ackerman of the American Embassy, and I was proud of the Chipmunk's second place. It is most unusual for a trainer to be able to compete on such occasions with private-owner types, painted, upholstered and fitted for the comfort of the passengers. Prizes were also won by a cream Miles Messenger and a Percival Proctor V.

During the latter part of the afternoon's programme the majority of the twelve different types included among the 38 visiting aircraft were demonstrated. In particular the Danish KZ VII (Alex Duncan) and the Auster (Mr. Pendleton) were

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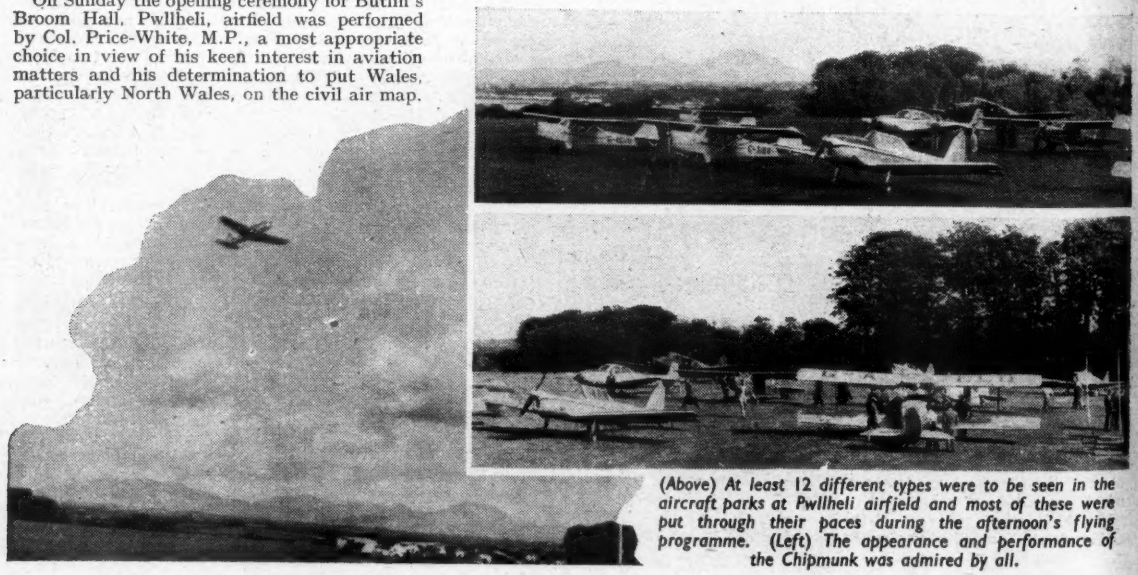


(Above) At least 12 different types were to be seen in the aircraft parks at Pwllheli airfield and most of these were put through their paces during the afternoon's flying programme. (Left) The appearance and performance of the Chipmunk was admired by all.

HERE AND THERE

PER ARDUA: The A.W.52, the flying wing made the journey from Baginton airfield, Coventry, to Boscombe Down, Hampshire, by road last week. The 36 feet long flying-wing encountered many difficulties en route and our picture shows trees being cut to assist its passage.

Services Centre

ON October 3rd Mr. Winston Churchill is due to open Churchill House, in Brighton, which is to be used as an entertainment centre for ex-Servicemen and women. Mr. Churchill will deliver his speech from the stage of Churchill House in front of a huge mural depicting men and women of the fighting and civilian war services. The mural, which measures 12ft x 20ft, was designed as a tribute to all who took part in the 1939-1945 war, by Michael Gilleney and his partner, David Anstruther. It was painted by Peter Rasmussen and Basil Smith.

Australian Air Control

LONG-TERM policy in Australia has resulted in plans being passed for the establishment of a school for the training of air traffic controllers. The first group of trainees is expected to begin a two-months' course almost immediately under three special instructors assisted by other experts from the Department of Civil Aviation. The Department's Superintendent of Education and Information, Mr. R. J. Sinclair, will advise on instructional methods and visual training aids, and trainees will be instructed in such subjects as rules of the air, meteorology, radio aids to navigation, airfield lighting and communications systems, as well as actual air traffic control procedures.

Indian Air Academy

ACCORDING to the *Times of India*, an institution to provide the youth of India and the countries of the East with training in flying, aeronautical engineering and allied subjects has been started in Bareilly, U.P. The Academy, which has the approval of the Government, is to be known as the National Air Academy. Praising the work of Air Service Training, Ltd., of Hamble, Southampton, the newspaper report adds that the National Air Academy will be conducted along similar lines. It is proposed to train 200 men there each year.

LADY OF THE LAKES: The first Proctor VI to be fitted with floats has been ordered by the Hudson Bay Company for use on Canadian lakes. Standard Edo floats are employed.

"Flight" Lecture

THE Women's Engineering Society recently announced the foundation of an aeronautical scholarship for women, details of which were given in *Flight* last week. Further evidence of the Society's interest in aviation matters was given at their conference last week-end. On Saturday, September 27th, the members visited Northolt aerodrome in the morning and in the afternoon attended a lecture on "Gas Turbines for Aircraft" delivered by F. C. Sheffield, of *Flight* technical staff.

Electron Jubilee

IT is fifty years since Professor J. J. Thomson working in the Cavendish laboratory at Cambridge discovered the existence of a new particle hitherto unknown to science and which subsequently became known as the electron. To celebrate the jubilee of this discovery an exhibition organized by the Institute of Physics was opened at the Science Museum, South Kensington, on Saturday, September 27th. The exhibition will remain open for at least three months, from 10 a.m. to 6 p.m. on weekdays and from 2.30 p.m. to 6 p.m. on Sundays. The public will be admitted free of charge during the times stated.

Stress Discussion

A SYMPOSIUM on Internal Stresses in Metals and Alloys has been arranged by the Institute of Metals in association with the Faraday Society, the Institute of Physics, the Institution of Mechanical Engineers, the Iron and Steel Institute, the Physical Society and the Royal Aeronautical Society.

The Symposium will be held on Wednesday and Thursday, October 15th and 16th at the Institute of Mechanical Engineers. Thirty-six papers have been received and a limited number of advance copies of the papers will be available at a charge of 5s.

The meeting is divided into three main sections: the first on the Measurement of Internal Stresses; the second on the Origin, Control and Removal of Internal Stresses; and the third on the Effects Associated with Internal Stresses. The

HERE AND THERE

first part begins at 10 a.m. on October 15th, and ends at 12.45; the second, at 2.30, ending at 5 p.m.; and the third, at 10 a.m. on October 16th, ending at 5 p.m.

Helicopter, Sir?

CITIZENS of Washington, D.C., may soon be able to hire helicopter taxis if the operation of an experimental service authorized by the Civil Aeronautics Board is successful. The service is to be run by the Yellow Taxicab Company and will operate between Washington Airport and the centre of the city. It is the first time that a helicopter passenger service has been authorized in the United States.

S.B.A.C. Scholarships

THE following have been awarded scholarships by the Selection Committee of the Society of British Aircraft Constructors and the Royal Aeronautical Society:—

D. Fletcher—S.B.A.C. Educational Grant, apprenticeship at Saunders-Roe, Isle of Wight.

D. I. Powell—S.B.A.C. Educational Grant, apprenticeship at the Fairey Aviation Co., Ltd., Hayes.

R. H. Hayward—John de Havilland Scholarship, apprenticeship at the de Havilland Aircraft Co., Ltd., Hatfield.

Mapping Australia

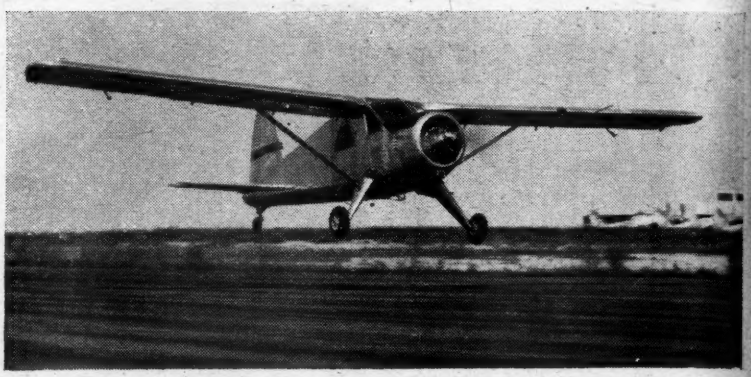
DURING the past four months the Royal Australian Air Force using Mosquito aircraft has been co-operating with the Commonwealth Survey Committee and the National Mapping Council to photograph some 45,000 square miles of territory in various parts of the Commonwealth. Employing vertical photography, much of the work has been carried out at a height of 25,000 feet giving a scale of 1:50,000, but in cases where more detail was required the machines flew at 15,000 feet to produce a scale of 1:30,000. South Australia, West Australia and Queensland were all included in the operations.

Mercury "Stands In"

IT is interesting to note that one of the oldest types of aircraft engines in service today, the Bristol Mercury air-cooled radial, is powering yet another new British aircraft—the prototype Boulton Paul P.108. The Mercury has been installed in the P.108, prototype for flying trials only, and production models of the aircraft, which is to be known as the "Balliol," will be powered by gas turbine engines when they become available. The Mercury was first designed as a special engine for the Short Crusader, one of the contenders for the 1937 Schneider-Trophy race. In 1935 it became the first British aircraft engine to be approved for controllable-pitch airscrew operation, and in the following year quantity production of the Mercury under the Shadow Scheme began.

F.A.I. Awards

AT the Royal Aero Club, Londonderry House, Park Lane, last week, Lord Brabazon of Tara, President of the Royal Aero Club and of the International Aeronautical Federation (F.A.I.), presented de la Vaulx medals, which are awarded by the F.A.I. to winners of world records, to Group Captain H. J. Wilson, who in 1945 established a world speed record of 606 m.p.h., and to Group Captain Donaldson, who last year increased the record to 616 m.p.h. The medals are a memorial to Count de la Vaulx, a pioneer of French aviation and one of the three founders of the F.A.I., who was killed in a flying accident in America in 1930.



SPECIALIST: The D.H.2. Beaver designed by the de Havilland Aircraft Company of Canada to meet the special requirements of Canadian Bush Pilots is powered by a Pratt and Whitney 450 Wasp Junior Engine, has a maximum speed of 160 m.p.h. and a range of 730 miles.

MEMORIAL PLAQUE: The de la Vaulx medal awarded to G/C. Donaldson by the F.A.I. at the Royal Aero Club last week. G/C. H. J. Wilson received a similar award. (See paragraph above.)

Survey Finishes

A RAPIDE Aircraft belonging to Hunting Aerosurveys, Limited, has completed a survey of Arabia and Persia involving a flight of over 55,000 miles.

The survey, details of which were given in *Flight* of June 5th, was carried out to investigate the possibility of a proposed reservoir to hold the flood waters of the rivers Tigris and Euphrates. Information in the form of maps and mosaics is now being prepared at the new laboratory of Hunting Aerosurveys, Limited, at 6, Elstree Way, Hertfordshire.

The laboratories were recently visited by members of the Commonwealth Survey Conference.

News in Brief

FOLLOWING his acquisition of the Aston Martin Car Company early this year, Mr. David Brown, head of the David Brown group of engineering companies and of David Brown Tractors, Ltd., has bought the goodwill, designs and work-in-progress of Lagonda, Ltd.

* * *

Twenty-three British pedigree pigs—4 boars and 19 sows—sold to Austria on recently granted credits, were flown from England last week to Schwechat Airport near Vienna.

* * *

The Directors of Vickers, Ltd. have given notice that an interim dividend of 4 per cent (actual), less income-tax on the ordinary stock of the Company in respect of the year 1947 will be paid on October 28th, 1947.

* * *

Lord Nathan, Minister of Civil Aviation, who has been making a tour of the Far East, is expected to arrive in London on October 5th. On his homeward journey by air he will spend a few days at Bangkok, Singapore, Ceylon and Karachi.

* * *

Memorial services to Sir Harold Kenward, Dunlop Director of Distribution, who died on the *Queen Elizabeth*, were held last week at Holy Trinity Church, Brompton, London, and St. Philip Cathedral Church, Birmingham. Many prominent personalities of the motoring industry were among those who attended.

* * *

A new airways terminal has been opened in The Hague by K.L.M. and a new organization, the K.L.M. Motor Coach Company, owned jointly by K.L.M. and the Netherlands Railways, has been formed to operate the fleet of 16 Crossley Coaches which will provide the ground transport between Rotterdam, Amsterdam, The Hague and Schipol.

* * *

MR. R. F. CARSE, who has been Service Manager of Gloster Aircraft Co. since 1942, has now been appointed Sales Manager. Mr. F. J. Turton, who has been Assistant Service Manager since 1942, will become Service Manager. Mr. Carse will, however, still be associated with the Service Department in an advisory capacity and on matters connected with its export side.

INTERIM TRANSPORTS

Civil Avro Yorks, closely related to the Lancaster bomber, are employed principally on Empire routes.

Yorks and Haltons Give Good Passenger and Freight Carrying Service

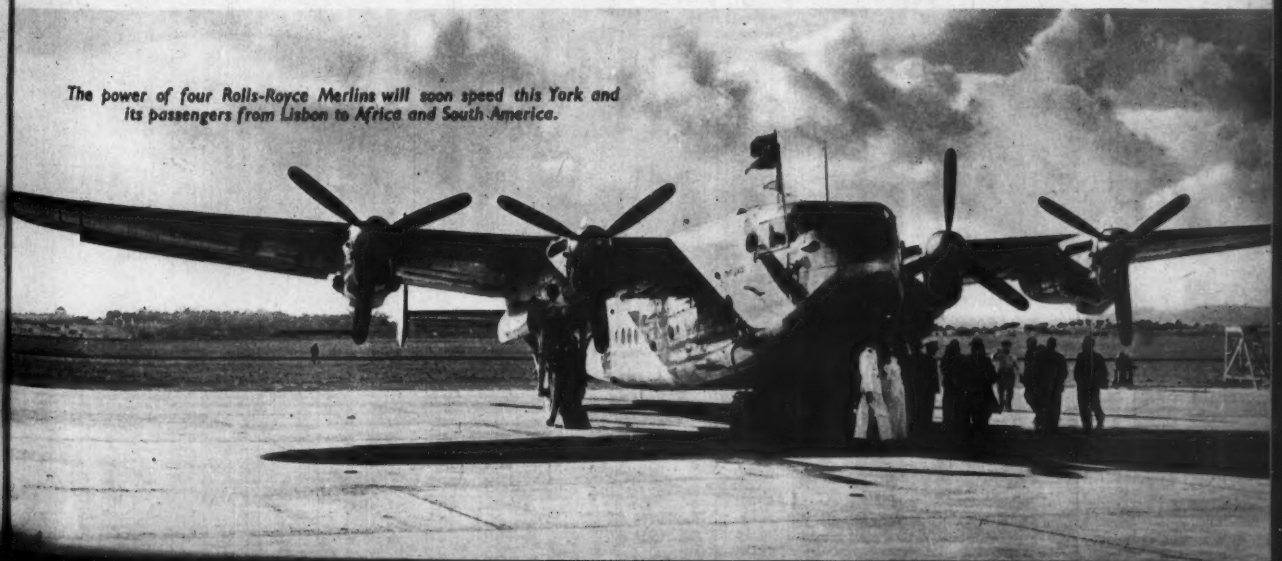
SO much is talked about the aircraft which are to equip our airlines in 1951, about those which may be coming into operation very shortly and about the temporary superiority of the larger American airliners that the excellent service which is now being given and has been given during the past many months by such stopgap machines as the York and Halton tends to be overlooked. B.O.A.C. in particular, B.S.A.A. to a lesser extent and several private operators have reason to be very thankful for these aircraft, many of which were purchased at a fraction of their true value and all of which have since been employed successfully and economically. Some notes follow on the operation and characteristics of Yorks and Haltons with particular reference to those used by B.O.A.C.

Developments have resulted in the wartime long-range freighter York being adapted for use also as a combined freighter-cum-passenger aircraft and as a passenger transport with a variety of seating arrangements. In addition to its many important uses in R.A.F. Transport Command the York has for some time been successfully operated by B.O.A.C. and B.S.A.A., by Skyways, Ltd., and by foreign companies such as F.A.M.A.

Based on the Lancaster bomber and retaining the same mainplane, the York also has four Rolls-Royce Merlin 24 power units. Provision is made for a crew of five—two pilots, navigator and radio operator are always carried and a flight engineer is optional. Yorks are now operating almost entirely on the Empire routes to the Middle East, India and Africa.

The 21-seat passenger version is prepared specially for B.S.A.A., the main cabin being divided into two

The power of four Rolls-Royce Merlins will soon speed this York and its passengers from Lisbon to Africa and South America.

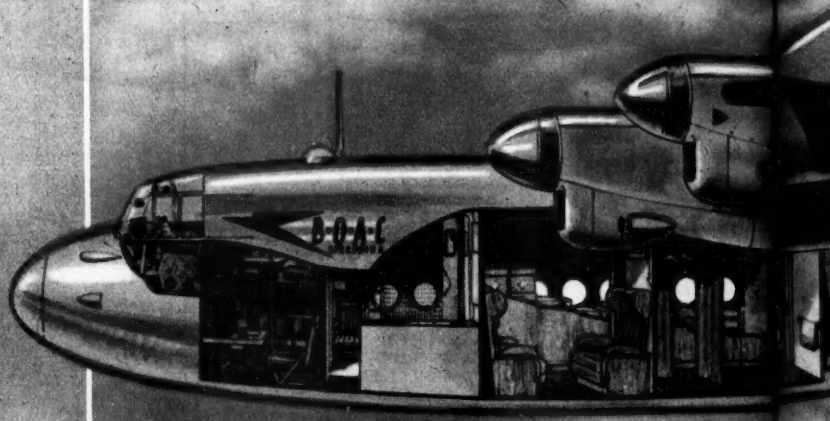


Interim Transports . . . . .

compartments of six and fifteen seats. B.O.A.C. use several freight-passenger combinations. In the layout illustrated provision is made for fourteen seats, twelve of which are convertible into bunks. The passenger accommodation is arranged principally in three compartments each with four seats, the extra two convertible seats being forward near the galley. Of the four seats in the aft compartment only two are convertible into bunks. The large, square-section fuselage permits unusually roomy and comfortable passenger compartments and three separate toilets are provided. The colour scheme is dark blue and buff and the woodwork is honey colour.

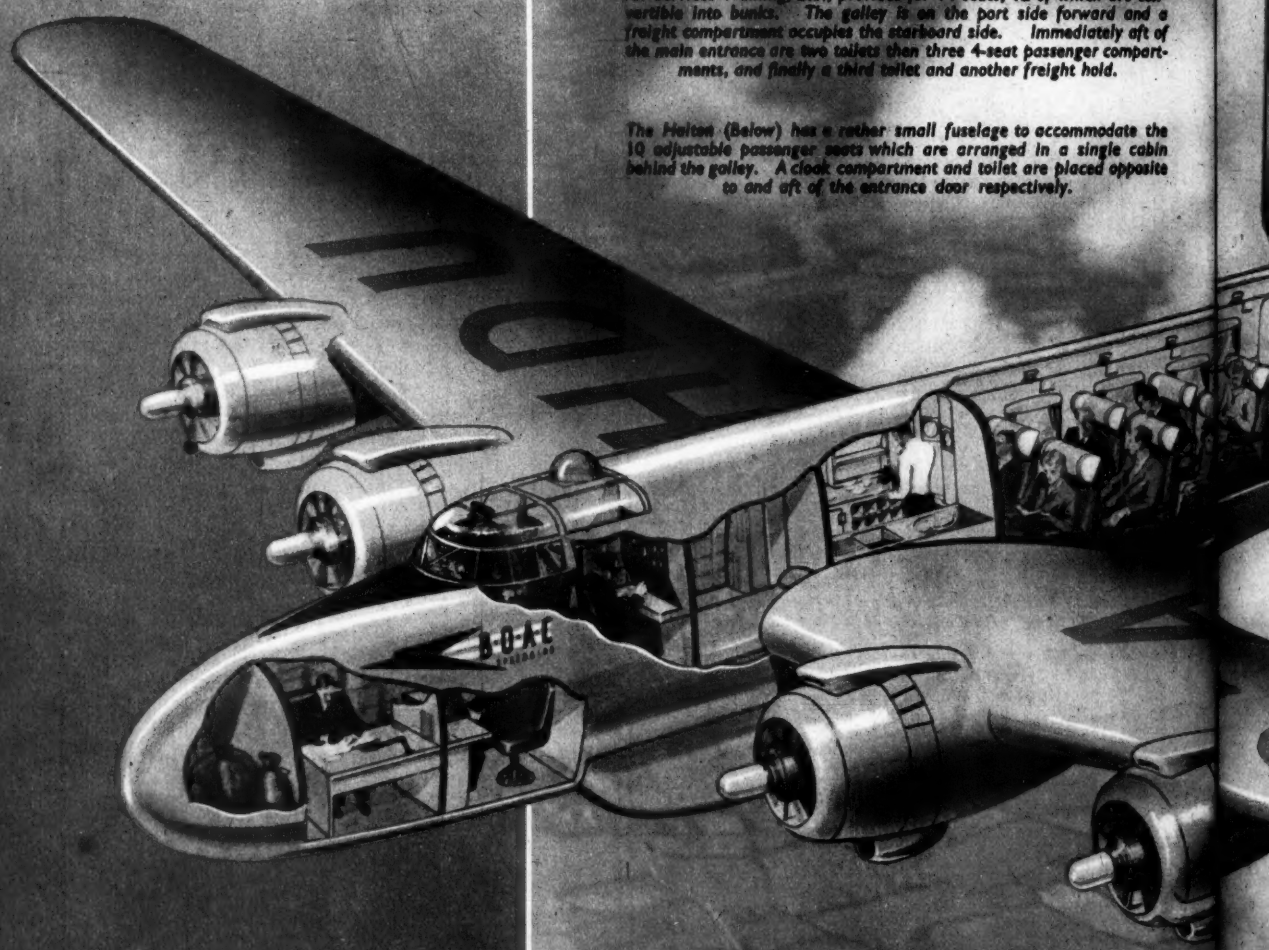
Recently some special tests were made with B.O.A.C. Yorks and 12-seater versions are now to undergo a rearrangement of accommodation to give an increase in the seating capacity. It has been stated that all B.O.A.C.'s Yorks may be refitted to take 18 seats and possibly a further three, making 21, the final increase being subject to all-up weight considerations.

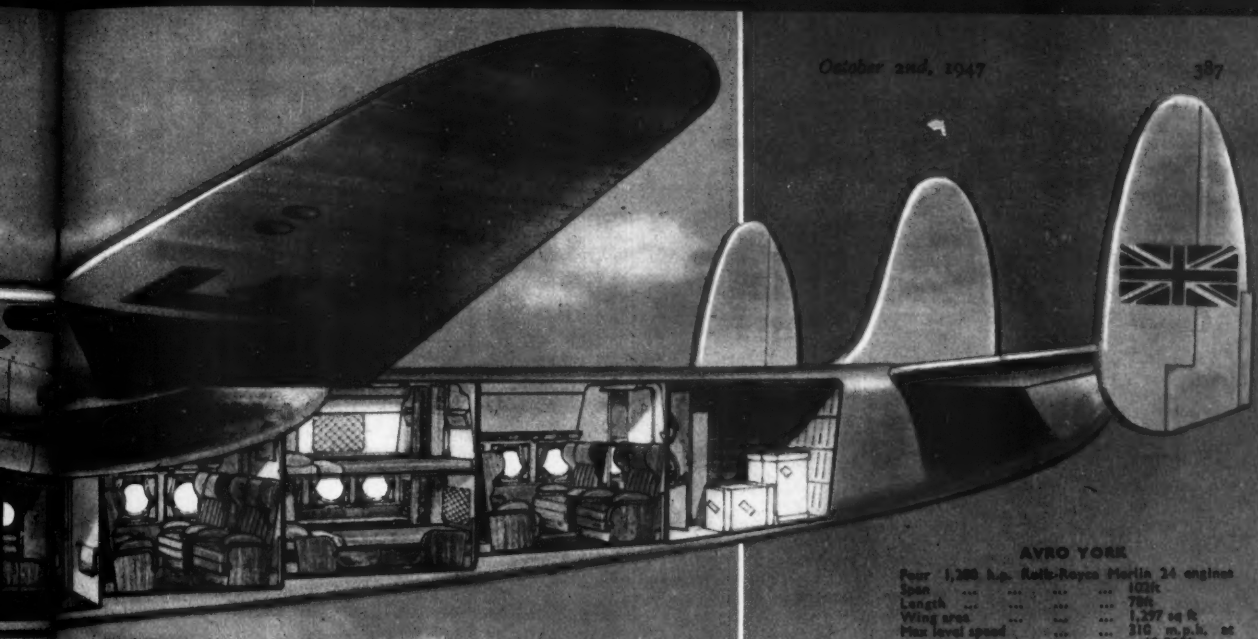
The names of B.O.A.C.'s Yorks



DETAILS of the interior planning of Yorks and Haltons as supplied to the British Overseas Airways Corporation are shown in these exclusive "Flight" drawings. (Above) The York interior, the work of Air Services Training, Ltd., provides for 14 seats, 12 of which are convertible into bunks. The galley is on the port side forward and a freight compartment occupies the starboard side. Immediately aft of the main entrance are two toilets then three 4-seat passenger compartments, and finally a third toilet and another freight hold.

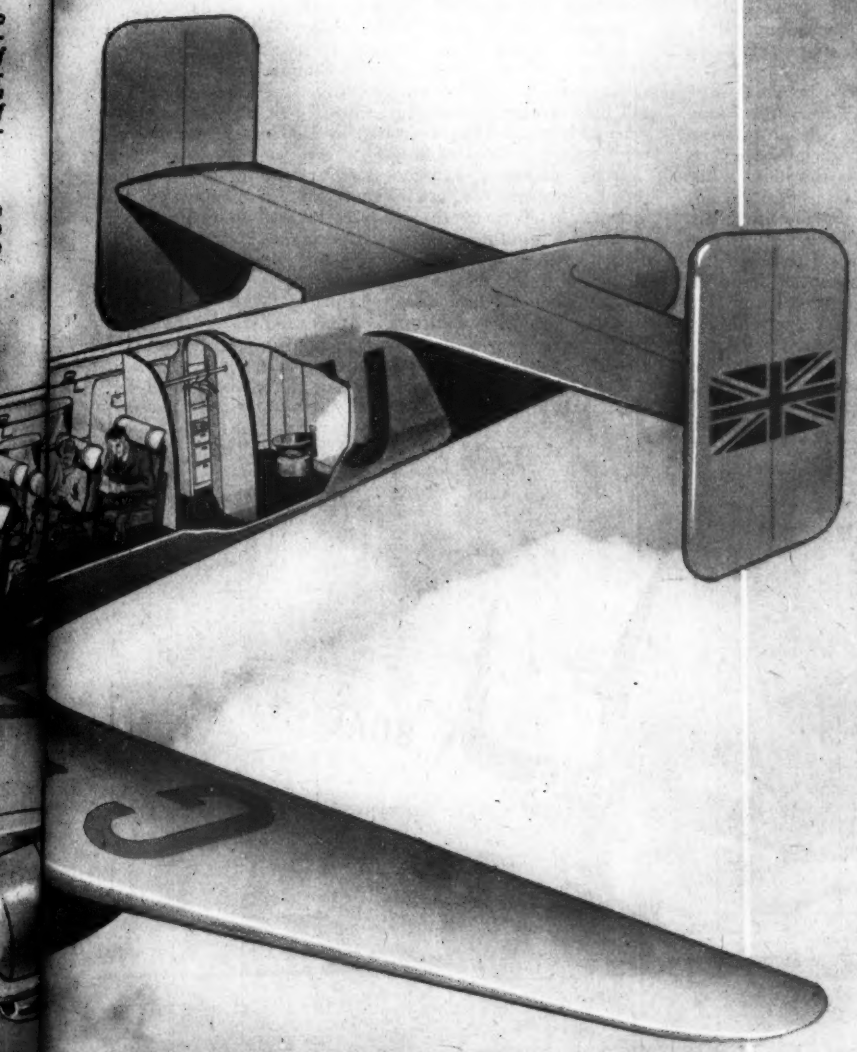
The Halton (Below) has a rather small fuselage to accommodate the 10 adjustable passenger seats which are arranged in a single cabin behind the galley. A cloak compartment and toilet are placed opposite to and aft of the entrance door respectively.





AVRO YORK

Four 1,280 h.p. Rolls-Royce Merlin 24 engines	
Span	102ft
Length	78ft
Wing area	1,297 sq ft
Max level speed	316 m.p.h. at 10,800ft
Max W.M. cruising speed ...	260 m.p.h. at 10,500ft
Max range (normal tankage) ...	3,100 miles
Tare weight	39,458 lb
Gross take-off weight	71,000 lb



are: *Mildenhall; Marathon Malmesbury; Mansfield; Middlesex; Mersey; Murchison; Manton; Moruille; Moray; Melrose; Monmouth; Montrose; Milford; Malta; Midlothian; Medway; MacDuff; Morley; Malvern; Marlow; Marston; Marlborough; Montgomery; Morecambe; Mandalay; Madras; Manchester and Melville.*

One of the best examples of the good service and reliability obtainable from the York when efficiently operated has been provided by Skyways, Ltd., who over twelve-month periods flew more than 4,500 hours with two of these machines.

During 1946, B.O.A.C. completed two months of intensive test flying with Handley Page Halifaxes on their 4,434-mile West African coastal route. This trial convinced them that a civil version—the Halton—would provide an efficient interim solution to their problem of operating high frequency long-distance services. The Corporation's official report is of interest in this connection. It discloses that, although the intention was to rest the Halifaxes for three months, sufficient data were available after only two months to prove that both the aircraft and the power plant were suitable for their requirements. Moreover, the maintenance man-hour rate showed

HANDLEY PAGE HALTON

Four 1,675 h.p. Bristol Hercules 100 engines	
Span	103ft 8in
Length	73ft 7in
Wing area	1,275 sq ft
Max level speed	320 m.p.h.
Max W.M. cruising speed ...	270 m.p.h. at 15,000ft
Max range (normal tankage) ...	2,420 miles
Tare weight	37,750 lb
Max all-up weight	68,000 lb

Handley Page Haltons are very similar to wartime Halifaxes, but the fuselage is furnished with comfortable seats, and freight or luggage is carried in the pannier underneath.

Interim Transports . . . . .

every indication of being better, in respect of the Halton, than for any other four-engined aircraft then operated by the Corporation. A figure of 3.94 man-hours per flying hour was recorded for the Halifaxes.

Twelve Haltons have been acquired by B.O.A.C. and they bear the names *Falkirk, Fitzroy, Falmouth, Flamborough, Forfar, Fleetwood, Fremantle, Fife, Finisterre, Falaise, Folkestone,* and *Foreland.* Superficially they resemble the Halifax C. VIII transports as supplied to the R.A.F., but even externally it can be seen that on the Halton there is a large entrance door on the starboard side, and ten windows, one for each passenger. Internal appointments include a galley and toilets. The bomb bay has been converted into a compartment—best described as a pannier—for 8,000 lb of baggage, freight or mail. The loading of this pannier, while it is in place on the aircraft, is readily effected by means of two hatches. Alternatively, it can be lowered with the aid of winches, enabling an empty pannier to be quickly replaced by a loaded one and facilitating rapid turn-around services.

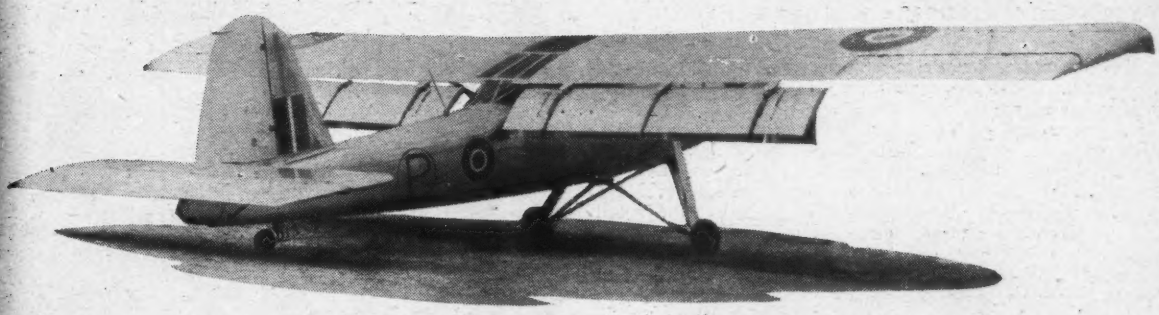
In the B.O.A.C. Haltons the seats are upholstered in blue, all-wool rep. The carpet is blue and the curtains of a contrasting rust colour. Adjustable tables are provided and there is a wardrobe for top coats and similar articles.

Speaking at Radlett when *Falkirk,* the first of the B.O.A.C. Haltons, was christened, by Lady Winster, Sir Frederick Handley Page said: "This is the first post-war civil plane to come from the Radlett works and it is a welcome change to make an aircraft for civil purposes."

In addition to those operated by B.O.A.C. Haltons have been sold abroad, while others are used by two major charter companies, London Aero and Motor Services and the Lancashire Aircraft Corporation. An indication of economy is given by the figure of 1.05 air miles per gallon which was obtained during the original Halifax tests already mentioned, this for a cruising speed of 205 m.p.h. at 10,000 ft on about 50 per cent of the take-off power. With the help of data collected during the last year, operators calculate that Haltons can be offered for charter at approximately 8s per mile or 1s per ton mile, and even less for exceptionally long journeys.

The engines of the Halton are four 1,675 h.p. Bristol Hercules 100s, fitted with de Havilland hydromatic airscrews.

Four Bristol Hercules engines are fitted in the Halton which has proved itself a very efficient long-range transport.



PRESTWICK PIONEER

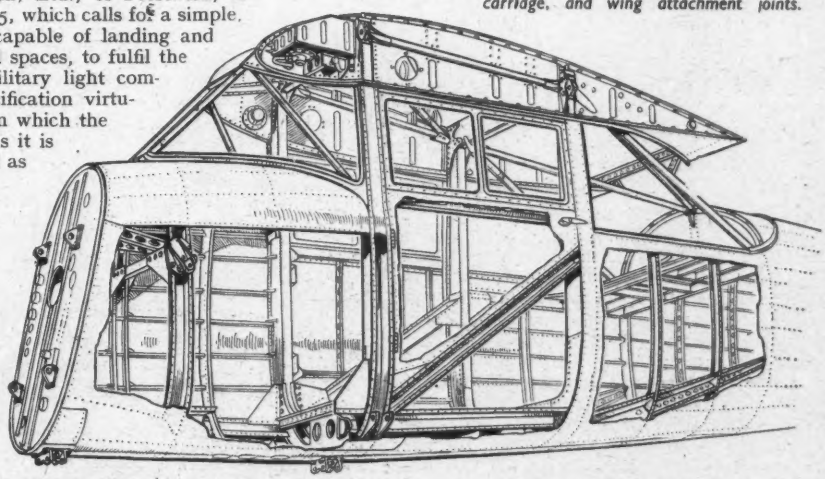
Appraisal of Scottish Light Communications Aircraft for Specialized Duty

THE reason for the existence of the Prestwick Pioneer, further prototypes of which are now being manufactured by Scottish Aviation, Ltd., of Prestwick, is to be found in specification A4/45, which calls for a simple, strong, single-engined aircraft, capable of landing and taking off in extremely restricted spaces, to fulfil the maid-of-all-work duties of a military light communications type. Such a specification virtually lays down the essential form which the the machine must take, and thus it is that the Pioneer can be regarded as something in the nature of a highly refined Fieseler Storch.

There are many duties open to a civil aircraft designed on such specialist military lines. For example, in areas where airfield facilities are either very restricted or non-existent, an aircraft which can take off and land in very small spaces—it is capable of carrying three passengers and baggage in addition to the pilot—should obviously find a deal of use. As an ambulance carrying a patient, nurse and, if necessary, a doctor, aircraft like the Pioneer could provide extremely welcome facilities in such areas as the Scottish Highlands and the Western Isles, whilst in remote places where landing is quite impossible mail could be picked up and delivered and so bring an expedition to the postal services in such regions quite beyond anything possible by means other than, perhaps, those of a helicopter.

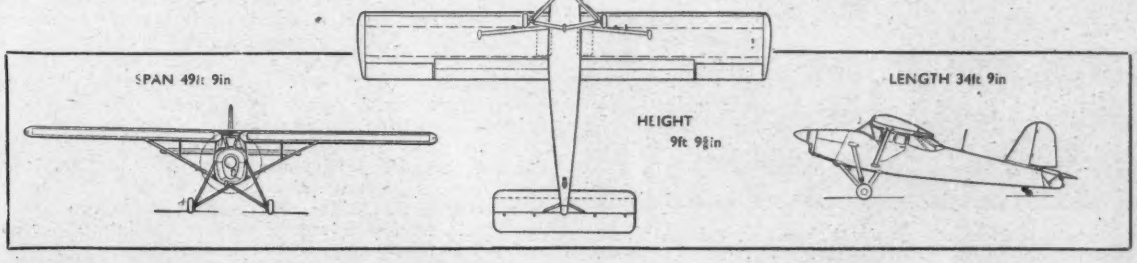
These are but one or two examples of work especially fitted to an aircraft of this character, but equally within its capability would be such duties are charter taxi work, aerial photography, crop dusting or dual-control training

Forward section of fuselage showing primary structure with engine, undercarriage, and wing attachment joints.



In fact, the Pioneer has everything offered by the conventional aircraft of its weight/size class, in addition to specialized qualities peculiar to itself. It can be supplied as a ski-plane or float-seaplane, alternatively to the wheel landing gear, and has been specifically designed to operate in any climatic zone from arctic to tropical.

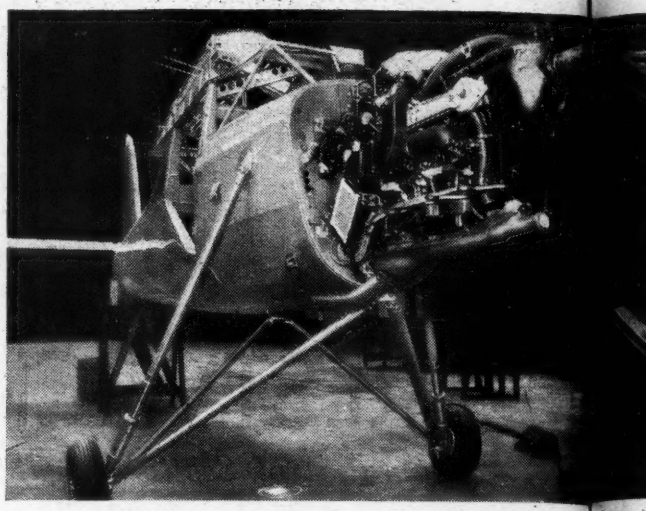
The Pioneer is all metal—although primary control surfaces are fabric covered—and its designed super-slow flying qualities have impelled the use of large-area Fowler flaps and full span leading-edge slats: in terms of percentage chord the latter of the largest yet known to have been built—they are 25 per cent chord surfaces—and



Prestwick Pioneer . . . . .

although not automatic in action in the ordinary sense of the term, are semi-automatic in that they are operated in conjunction with the Fowler flaps during the initial 20 degrees extension of these latter surfaces. With a theoretical stalling speed of 33 m.p.h. the Pioneer is, for its weight and size, perhaps the slowest-flying aircraft in existence.

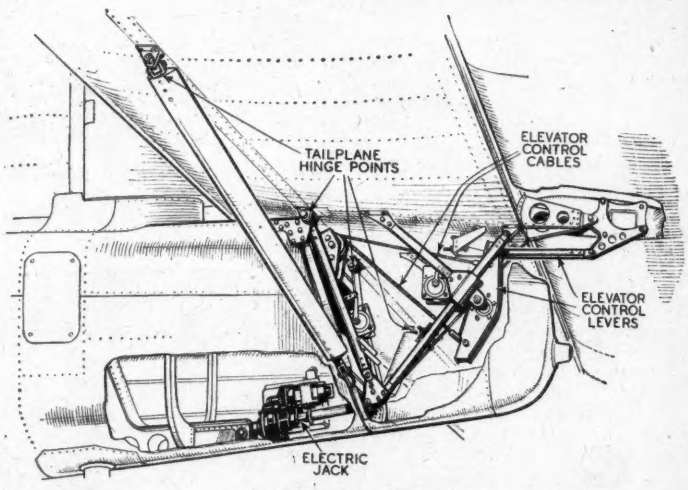
Tied up with the ultra-slow flying requirements is the matter of aircraft attitude, for in order to get the speed down to so low a target figure, the angle of attack of the wings is such that the aircraft must take a severe nose-up attitude. Were means not provided for compensation this would result in a tailplane stall, but to obviate such an occurrence the tailplane is pivoted on an axis close to its leading edge so that by actuation of an electric screw jack its incidence can be negatived. The angular range of tailplane movement is, on the prototype, 14 degrees, although it is almost certain that the actual range finally required will not exceed 8 or 9 degrees, but whereabouts this will occur within the present range will not be known until proved by flight trials. Operation is initiated *à la* Constellation by a two-way switch fitted on the spade grip of the control column—in point of fact the switch is a modification of the standard Dunlop gun-firing switch. This has much to commend it since the pilot is selecting the degree of tail balance he wants with the hand which is actually sensing the elevator loads: the sensitivity provided is such that changes in elevator incidence of six minutes of arc are possible. Although an adjustable tailplane is a necessity for the slow speed performance of the aircraft, it does, of course, incidentally furnish a convenient medium for tail trimming.



The low engine position, fine skinning, and simple yet "stalky" undercarriage, can well be seen in this view of the first prototype.

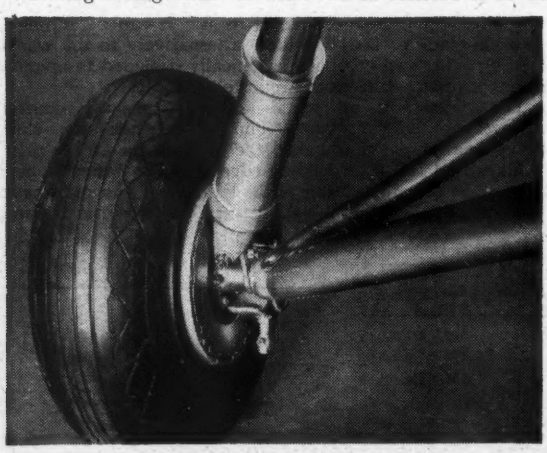
Excellent Field of View

The pilot sits centrally and approximately beneath the line of the wing leading edge, and so artfully has the engine installation been devised that he is afforded a line of sight which is actually below the horizontal when the aircraft is on the ground: an exceptional quality, this, in a single-engined machine. The view in other directions is good, particularly forward and down, and the rear seats are set at a lower level than the pilot's so that he can see rearward with the least inconvenience. Upward view to the side is, of course, blanketed by the wing, this being virtually unavoidable in a parasol type, but the Perspex coupé top does allow upward visibility over a fairly wide central zone.



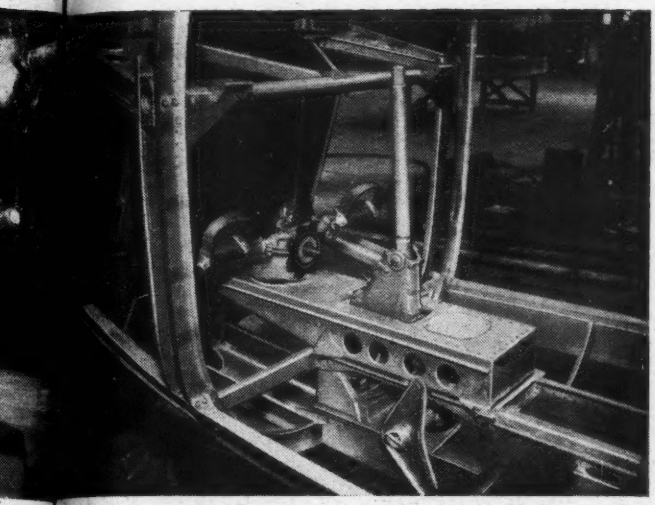
Detail of tailplane mounting structure showing incidence actuator and elevator control linkage.

Seating arrangement—in what can be referred to as the standard civil version—comprises two side-by-side seats behind the pilot, with a third single-seat behind them, The pilot's seat is a remarkable piece of work in that it is stressed for 30 g yet has a bare structure weight of only 26 lb; it is, of course, adjustable, and to facilitate access the back is arranged to fold down rearward *à la* Beaufighter. Passenger seats have the extremely low bare structure weight of 4½ lb, and are designed to take parachutes of seat, back, or lap type, or, alternatively, can be cushion upholstered. Aft of the rear seat is a commodious space for baggage stowage. Access to the cabin is through large forward-hinged car-type doors on each side, but the threshold height above ground is likely to make entry and exit a matter of some personal agility. This, of course, is occasioned by the tallish undercarriage which, in turn, is necessitated by the low-speed stalling attitude: truly can it be said that aircraft design is a matter of compromise between conflicting requirements.



Detail of wheel mounting showing single-disc brake and oleo shock absorber. The latter caters for a sinking speed of 14 ft/sec.

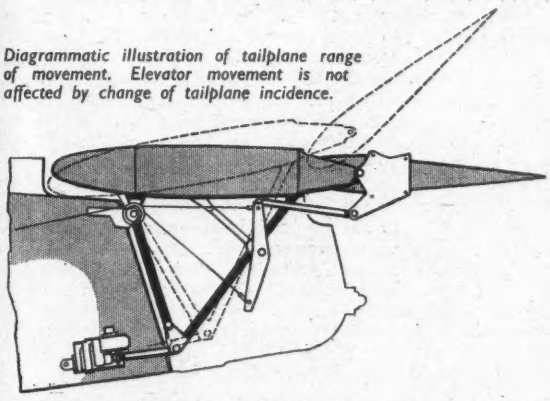
On the score of workmanship the prototype Pioneer is the most beautifully built aircraft we have examined for some considerable time, this quality being all the more noteworthy in view of the very light gauge (26) of the skin panelling. As a structure the design is of interest for its extreme simplicity and obvious strength.



The Fairey standard column and S.B.A.C. pedal unit are mounted as a sub-assembly to the fuselage keel structure.

The fuselage is basically a semi-monocoque employing pressed channel-section frames and drawn Z-section stringers, but to supplement this a fabrication of primary structural members is embodied in the forward section to distribute the point loads of the engine, wing, and undercarriage attachments. Chief among these primary members are the U-frames to which the wing spars are anchored. In

Diagrammatic illustration of tailplane range of movement. Elevator movement is not affected by change of tailplane incidence.



conjunction with these frames the lower longerons and the raking members which form the door thresholds give an effective triangulation, whilst the heads of the frames are tied by box-form "lintels." Triangulation in the plane of wing attachment is provided by side tubes and a central diagonal strut, and whilst the forward section of the coupé is made up by the front screen framework, the rear is stiffened with a twin-V tubular strut layout tying the rear main frame to the monocoque after fuselage.

A keel beam is incorporated in the major forward part of the fuselage, the head attachment points of the undercarriage rear V-struts being supported directly from this. As well as forming a convenient mounting structure for the control column and pedal units, the keel is also intended to house, and take the reaction loads of, a message/mail pick-up hook and/or a cable-laying unit.

In the tail cone of the fuselage is a semi-bulkhead frame on the crown of which the foot of the forward fin post picks up. Roughly 24in aft is a bulkhead with a reinforcing box fabrication on its rear face: this forms the mounting structure for the tailwheel strut and carries the attachment fittings for the fin rear post. The control rocking lever for rudder operation is pivoted in this box, and a beam extension at the base acts as a reaction mounting for the tailplane incidence motor. The fuselage terminates at a reinforced sloping frame, at the top of which are forged side-plate fittings in which the tailplane pivots: the radius struts which brace the tailplane pick-up at the foot to straps riveted to the base of the frame in a shallow V.

Wing Details

The spar frame "lintel" members terminate with forged fork fittings into which are pin-jointed the lugs on the inboard ends of the spars. At the front spar the joint is made in line with the top boom, but on the rear spar it is positioned about one-third down the spar depth. Both spars are made with plate webs bounded by drawn heavy-gauge lipped-angle booms to which extruded reinforcement is applied in way of the bracing strut anchorage. Chordal ribs are all similar sheet pressings with swage-edged lightening holes; webs are stabilized with channel chordal strips, the lower of these forming the undersurface skin attachment flange. Leading edge formers are pressed sheet with flanged doubling plates, and forward of these is the nose skinning, the lower base line of which incorporates a wood fillet to which the underside of the slat nosing can seal. Trailing edge ribs are channel-section pressed crescents to form the flap retraction recess: those ribs in way of the

PRESTWICK PIONEER

de Havilland Gipsy Queen 34 engine of 240 h.p. driving a 7ft 6in dia. D.H. 2-blade c.s. airscrew.

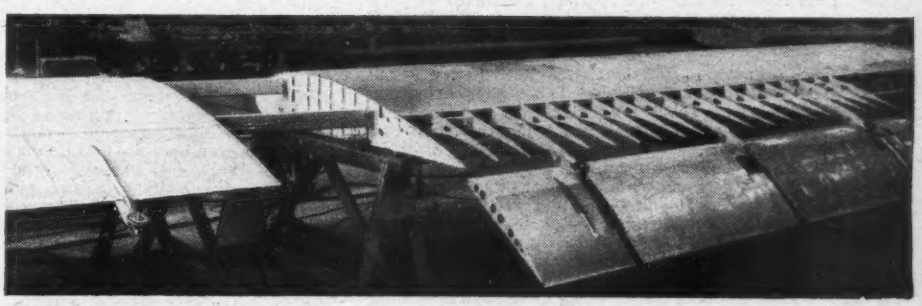
Dimensions and Weights

Span	49ft 9in
Length	34ft 9in
Height	9ft 9¾in
Ground angle	11 deg. 20 min.
Wing area, gross	390 sq. ft
Aspect ratio	6.35
Aerofoil	NACA 4415
Dihedral	1 deg. 0 min.
Incidence	4 deg. 0 min.
Tailplane span	16ft 6in
T/P and elevator area, gross	77.46 sq. ft
Flaps area per wing: Fowler	34.8 sq ft
Split	17.4 sq ft
Gross weight	3,630lb
Wing loading	9.3lb/sq ft
Percentage structure weight	38.7
Power loading	15.13 lb/b.h.p.

Performance (Designed)

Max. all-out speed	124 m.p.h. T.A.S. at S.L.
Max. cont. cruise	118 m.p.h. T.A.S. at 2,000ft
Max. economy cruise	114 m.p.h. T.A.S. at 3,800ft
Climbing speed	70 m.p.h. at S.L. = 776ft/min
Take-off Conditions, 3,600 lb, wind speed 0 m.p.h.	
Unstick	108 yds
To clear 50ft	260 yds
Landing Conditions, 3,600 lb I.A.S. 33 m.p.h.	
From clearing 50ft	187 yds
Ground run	52 yds

Range	Payload	Speed	Altitude
365 miles	680lb	114 m.p.h.	3,800ft



Starboard wing with trailing edge un-skinned showing Fowler flap extended.

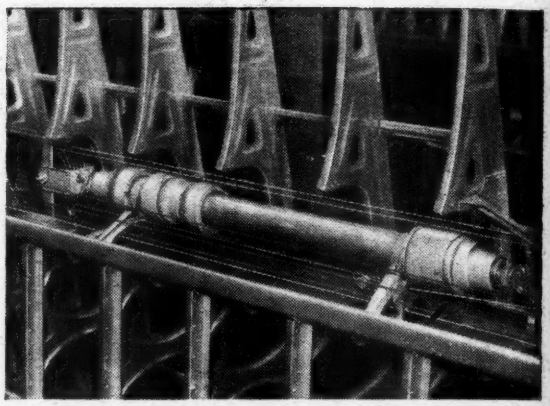
Prestwick Pioneer . . . . .

ailerons are of similar construction but of different shape. To take the bracing strut, a chordwise V-bracing is anchored between the spars by box brackets, the apex picking-up to a forged fitting to which a trunnion is attached, this in turn picking-up to the head of the strut.

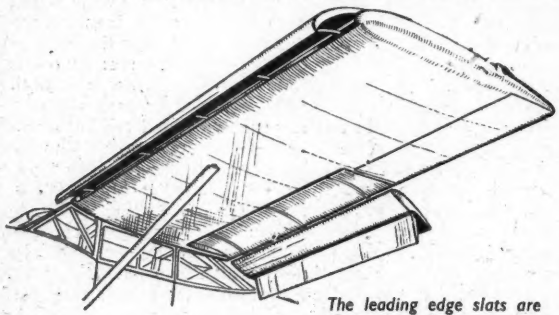
Leading edge slats are built up on a channel-section main spar with diaphragm nose and chordal ribs, the latter being stabilizised by intercostal channel "rear spar" members. Each slot is supported on five tracks, these being bolted as cantilevers from a box structure at double chordal ribs, and each track carries a fixed length of roller chain which acts as a rack for engagement with the driving sprockets. These are embodied with a torque tube running along the leading edge in outboard and inboard sections driven from a mid-span unit itself driven by chain from the actuating jack.

The Fowler flaps are built-up rather in the manner of the slats, and incorporate split-type subsidiary flap surfaces in their trailing edges. Operative action is such that, as the Fowler flaps extend back and down they reach a given point where one projecting end of a bell-crank connects with a fixed pin, and thus is caused to swing. The other crank arm is pivoted to a push-pull strut so that the split flap is opened: conversely, the projecting head of the bell crank, when the Fowler flap is retracted, slides under the upper wing surface and so closes the split flap.

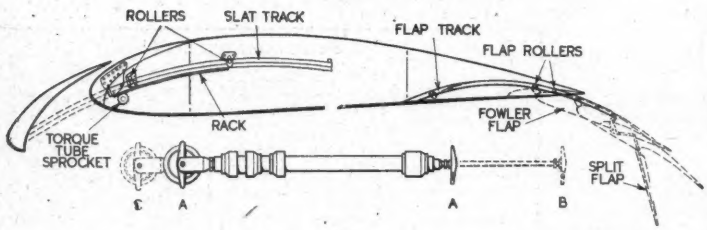
Both slats and main flaps are hydraulically operated by a single, double-acting two-part jack. For take-off and approach selection, one jack piston rod extends and so actuates the slats and flaps, but for the final landing manœuvre an additional control selection is made and the second jack piston extends; in so doing the Fowler flaps are farther extended which, in itself, operates the split flaps. The hydraulic system operates at a pressure of 2,400 lb/sq in, the rod side of the jack pistons being subjected to pressure the whole time; when, however, extension is required pressure is admitted also to the free side of the pistons, the consequent pressure x area differential resulting in rod extension. The single-disc type wheel brakes are hydraulically actuated, as also is the windscreen wiper, and although the hydraulic accumulator is relatively small, the pressure storage is said to be sufficient to operate the flaps, slats and wheel brakes 90 times, should the engine-driven pump fail.



Detail of the slat/flap actuating jack fitted on the rear spar. The trailing edge and interspar rib structure are also clearly shown.



The leading edge slats are 25 per cent chord and work in unison with the Fowler flaps. These are fitted with subsidiary split-flaps.



Schematic operation of slats and flaps. Extension of right jack from A to B opens L/E slats and extends flaps 20 deg. Movement of second jack from A to C extends flaps farther and thus opens split flaps.

BACK ON MONDAY

(*Continued from page 382*)

able to demonstrate unusually short take-offs and slow flying. A Miles Magister which departed almost before it was recognized and the Chipmunk provided the aerobatic displays.

Prizes were also given for the arrival competition, and Mr. Danby in his Proctor V, like the *concours d'élégance* winners, received a voucher for a free seven or fourteen days at Butlin's camp plus pocket money—five or ten pounds—for the holiday.

Monday morning saw an early start for the remaining air visitors and 9/10th cloud again dictated an over-the-top transit of the Welsh mountains. The flight home after fixing our position over Worcester was as uneventful as it was enjoyable, and in less than two-and-a-half hours I had returned to Fair Oaks, dropped my passenger and luggage and reluctantly delivered the Chipmunk back at Hatfield.

Considering for a few moments the qualities of the Chipmunk, I do not wish to alter my first good impressions, printed in *Flight* of August 21st, but I would add comments on the following details. For cross-country or private touring more luggage space must be provided, particularly if first-aid kit and batteries are to be carried in addition to maps and clothing. No one should have to swing airscrews these days, whether as an instructor, pupil or private owner, nor should it be necessary to lift the cowling to prime an engine. The oil-filler cap seems to be designed for maximum inconvenience, both for unscrewing the cap and pouring in the oil. A folding sun shield might well be attached to the vertical tubular member immediately behind the windscreen. The Chipmunk, which can be brought in safely at 60 m.p.h. with flaps down, still has excessive float after levelling off prior to landing. It would seem, therefore, that additional flap or air braking surface might be provided with advantage. The cockpit enclosure lacks rigidity.

It might be argued that some of these small criticisms or suggestions are not fairly applied to an aircraft designed purely for elementary training, but my answer would be that convenience and comfort are just as important to a pupil and instructor as to the private owner, and, in any case, what trainer has even been used exclusively for its primary purpose? A Magister, Tiger, and even an old Blackburn B2 flew to Pwllheli, presumably on non-training duties. It is a pity, incidentally, that the B2 was not more widely appreciated during its active life as a trainer. There is room for a new side-by-side all-metal design and it is on the score of its tandem arrangement that I might criticize the Chipmunk were I still an elementary instructor. However, as far as handling is concerned, particularly ailerons, nothing could be sweeter.

CIVIL AVIATION NEWS

Members for Special M.C.A. Committees : British Air Aid in India : Alternative Sites for Marine Base

CARRYING THE SHAMROCK : Aerlinte Eireann have taken delivery of three Constellations which are expected to be flying on the London-Dublin route in about a month. The Irish Airline have ordered five of the type and will commence trans-atlantic operations next spring.

Developments in the Tudor Situation

THE controversy between A. V. Roe, Ltd., and B.O.A.C. was commented upon briefly in last week's *Flight*. The suggestion earlier in the week that the Tudor I would probably be used by B.O.A.C. only as a pure freighter came as a climax to a situation which has long been deteriorating. The accuracy of the broadcasted statement was not denied by the Corporation and Sir Roy Dobson, managing director of Avros, considered it expedient to make a public statement.

Later in the week he visited the Minister of Supply and stated that the best action the Minister could take would be to place the Tudor I in service as soon as possible. The Minister of Supply subsequently announced the formation of a committee of four to enquire into and report on the development and production of the Tudor I for B.O.A.C. The four members of the committee are Air Chief Marshal Sir Christopher Courtney, who before retiring from the R.A.F. in 1945 was Air Member for Supply and Organization on the Air Council; Mr. James Mould, a barrister specializing in patents cases; Mr. Joseph Taylor, company director and independent member of the Air Registration Board and assistant general manager of the Workers' Travel Association; and Mr. George Wansbrough, a director of the Bank of England and chairman of a number of important companies. The terms of reference of the committee have been left as wide as possible, and the report and recommendations, when complete, will be submitted to the Minister of Supply, after which they will probably be made public.

Progress Report

At this stage of the proceedings it would be improper to make further comment, but at the time of Sir Roy Dobson's statement he issued a synopsis of the development of the Tudor I, which, together with the brief statement by B.O.A.C. in reply to the allegations, we have summarized.

In a brief history of the Tudor I, Sir Roy revealed that the company had conceived a new high-speed long-range airliner at the end of 1943, the rough details of which were submitted to the M.A.P.; discussions then took place between the Ministry, the Brabazon Committee and B.O.A.C., as a result of which Avros were asked to submit proposals for a version suitable for operating on the North Atlantic route. B.O.A.C. requirements included a still-air range of 4,000 statute miles operating at 25,000 feet, which, with the power plants available, reduced the size of the cabin to the smallest possible commensurate with the agreed payload of approximately 4,000 lb. The proposals were submitted to M.A.P. in June, 1944, and were accepted by B.O.A.C. as a basis for a specification which ultimately became known as the Tudor I. A full-scale mock-up fuselage was inspected by B.O.A.C. and M.A.P. in August, 1944, when the Corporation accepted the flight deck in principle but rejected the cabin arrangements as being inadequate to give the required standard of luxury for 12 passengers. An increase in dimensions was then called for; new drawings were made and a further complete mock-up was built within four months. Before it was finished, however, the Corporation requested a further increase in length of two feet, and at a conference in February, 1945, B.O.A.C. approved the design for production. Sir Roy stated that in spite of the increase in dimensions and gross weight, the company adhered to the estimated performance with a payload of 4,000 lb and still-air range of 4,000 miles. The operating height was, however, reduced to 20,000 feet. During this time prototypes were being built, and in June, 1945, the first was completed and flown. Numerous aerodynamic problems were revealed which had not previously been encountered, and at the same time the basic engineering requirements decided upon by the I.C.A.O. meeting in Chicago made necessary a further change in design, the tail unit being most affected. Pressurization of the fuselage also presented a new problem, since cabin atmosphere control was in its infancy and construction of the Tudor represented the first attempt in this country to produce a large pressurized aircraft. Considerable assistance was forthcoming from other manufacturers in the development of special equipment, and the M.A.P. co-operated to the full. Official flight trials commenced at Boscombe Down in April, 1946, continued throughout the summer, and a provisional C. of A. was granted in November of the same year. The manufacturers were then under the impression that a series of trials over the routes would be made. The Corporation, however, chose at random one of the Tudor Is for flight testing on the Nairobi route and Sir Roy Dobson considered that to be an indication of a secret B.O.A.C decision *not* to operate the type over the North Atlantic. As a result of the trials, B.O.A.C. issued a report in February, 1947, alleging three major defects and declaring the aircraft unsuitable for any of their routes.

Air Chief Marshal Sir Christopher Lloyd Courtney.

Mr. Joseph Taylor.

B.O.A.C. Indecision

The manufacturers had already instituted a series of aerodynamic investigations to improve the efficiency of the aircraft and by March 17th, 1947, the Corporation's criticisms had, in the view of Sir Roy Dobson, been completely cleared up. At that time B.O.A.C. refrained from answering a M.O.S.

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question as to whether the Corporation intended to operate Tudor I aircraft on the North Atlantic route. According to Sir Roy the manufacturers made unsuccessful efforts during ensuing months to obtain from B.O.A.C. a complete statement of the essential modification standard necessary to enable the aircraft to be put into service. After the change in direction of B.O.A.C. a visit was made to Avros on July 17th, 1947, by Mr. Whitney Straight and his Chiefs of Staff to discuss the utilization of Tudor I aircraft. Mr. Straight stated that the Corporation had decided *not* to use the Tudor I over the Atlantic whether or not it met the original specification requirements, as a range of 4,000 miles was inadequate. To the manufacturers the statement appeared illogical in view of the fact that available evidence indicated adequate range with the designed payload. Sir Roy Dobson suggested that if the still-air range of 4,000 miles was considered inadequate the operations of other airlines, such as T.C.A., over the same route might be compared: that Company had maintained regular all-the-year round schedules since 1943, and their present aircraft had a range considerably less than that of the Tudor I.

For Empire Routes

A request from B.O.A.C. followed the previous statement, for an investigation into the possibilities of operating the Tudor I on Empire routes and at a further meeting it was agreed that the Tudor I could carry a capacity payload of 6,400 lb on any express stage, and it was further agreed that accommodation should be increased from 12 seated or sleeping passengers to an arrangement for 24 passengers. Such a change could be quick and comparatively cheap. At that meeting Mr. Whitney Straight was unable to give an immediate decision on the final modification standard required, but he announced that the utilization of Tudor I aircraft on Empire routes was to be investigated and a decision would be announced. Nothing further had in fact been announced by B.O.A.C.

Mr. George Wansborough.

Following the brief history of the Tudor I, Sir Roy Dobson accused the Corporation of causing an incredible amount of confusion. Conflicting and ever-changing opinions, he said, indicated that B.O.A.C. did not seem to know its own mind from one month to the next and an interminable string of alterations had seriously delayed the Tudor production programme. B.O.A.C. had, he said, called for some 200 additional modifications to the first production aircraft and before they were completed a further 50 were requested. He also stated that the standards requested of Avro had not been demanded by B.O.A.C. in those foreign aircraft which had been ordered, particularly with regard to dimension, seating arrangements, equipment and the quality of the fuel used. The firm, he said, were justifiably proud in having developed the Tudor to be ready for operation in a period of three years, which compared with the American manufacturers who had required six years to place the Constellation on internal routes and that it was not used on regular overseas routes until a year later and even now they were having their problems. He stated that the conviction had grown amongst the work people that the string of alterations had been demanded deliberately to prolong construction and postpone eventual operation so that when the type finally went into service it would already be out of date. Such tactics, he stated, would provide a powerful argument to justify the purchase of foreign aircraft. The effect was far-reaching and in the balance there was not only the fate of the Tudor I but also the Tudor II and the welfare of some 10,000 workers and some ten million pounds of taxpayer's money. At the same time congestion in the design and technical departments was holding up progress on new projects.

Mr. James Mould

Sir Roy Dobson stated that the Company would have no part in a proposal to convert Tudor I aircraft for all-freighter purposes. He considered that it would require extensive scrapping of expensive materials and equipment and serious re-designing of the structure.

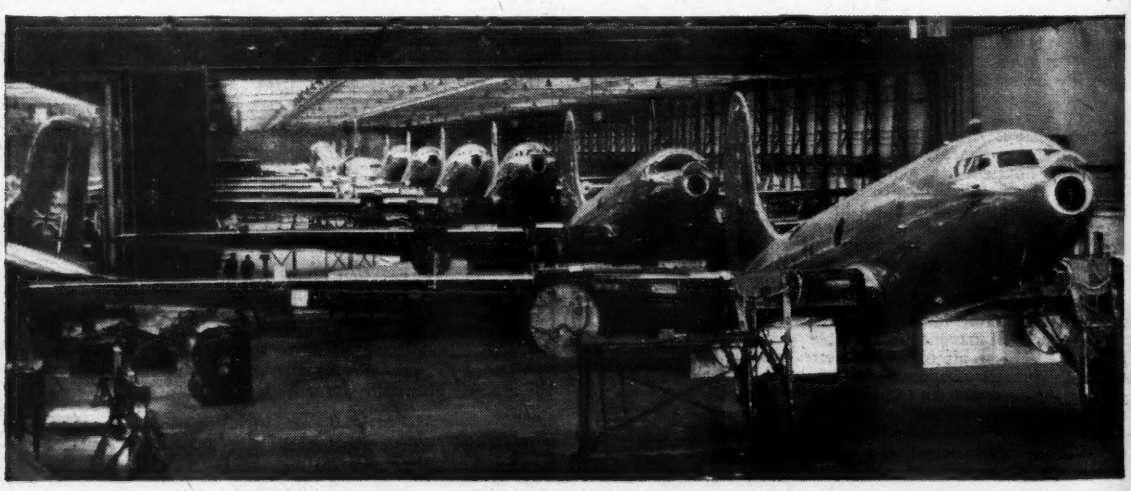
In conclusion he affirmed his confidence in the Tudor I as an efficient aircraft for the purpose for which it was designed.

B.O.A.C. Statement

In reply, B.O.A.C. issued the following statement:—

Sir Roy Dobson's statement to the Press on September 22nd places the responsibility on B.O.A.C. for the delays in bringing the Tudor I aircraft into service. The Board regrets that Sir Roy has seen fit to make this and other serious allegations against the Corporation, the accuracy of which it emphatically denies. The Corporation considers it essential that an enquiry should take place into these charges. The Board wishes to make it plain that in refraining from engaging in open controversy it is actuated solely by the desire to avoid an exchange of public statements which can only result in harm, and not least to the British aircraft industry.

The present production situation may be summed up as follows:— One Tudor has been modified completely to B.O.A.C. requirements to date, and this aircraft will shortly be tested at Boscombe Down for a full C. of A. The remaining Tudors could be sent on service trials immediately since the provisional C. of A. for the type is still valid. The manufacturers, however, are waiting to hear from B.O.A.C. their intentions with regard to the Tudor I as they have been asked to study the possibility of using the Mark I on Empire routes. It has been suggested that the 12 seats should be substituted by 24 or the fuselage extended by 6ft to allow accommodation for 32 seated passengers. During the past few months of indecision Avro's have taken the opportunity to make improvements which were not originally called for. The Tudors may now be seen with shortened undercarriage, improved leading edges incorporating T.K.S. de-icing elements, and other less apparent modifications.



A line of Tudor I aircraft in the assembly sheds at A. V. Roe's airfield at Woodford. Although many aircraft have been flown, others still await power plants. The goodwill tour of the first and fully modified Tudor IV has been delayed.

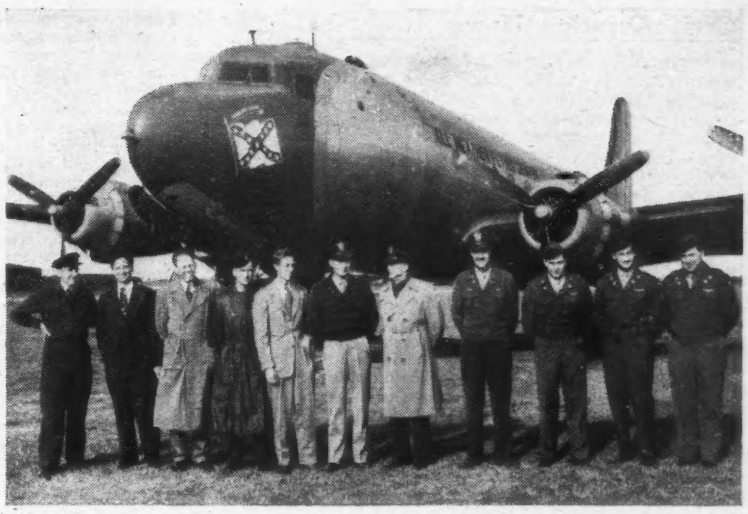
TWO M.C.A. COMMITTEES

DETAILS were published in *Flight* of July 31st of two Committees which had been set up by the Ministry of Civil Aviation, one to consider licensing, recruitment and the training of civil aviation personnel and the other to consider the certification of aircraft and the approval of equipment. As announced at that time, the Chairman of the first Committee is Group Captain C. A. B. Wilcock, and the chairman of the second Committee is Air Commodore W. Helmore. In order to ensure that they work with close liaison and contact the Chairman of each Committee is to be the Vice-Chairman of the other. Members of the Licensing Committee are:—

Air Commodore H. G. Brackley, B.O.A.C.; Lord Dukeston, Member of the National Civil Aviation Consultative Council; Group Captain R. C. Hockey, Director, Flight Department, College of Aeronautics; Captain J. W. G. James, B.A.L.P.A.; Dr. R. L. James, St. Paul's School; the Marquess of Londonderry, G.A.P.A.N.; Sir Eustace Pulbrook, late Chairman of Lloyds; Wing Commander J. R. Robinson, M.P.; and Sir Miles Thomas, Vice-Chairman of the Nuffield Organization.

Members of the Committee for the certification of aircraft are:—

A.V-M. D. C. T. Bennett, B.S.A.A.C.: F/L. F. Beswick, M.P.; Mr. H. Brotherton, National Joint Council for Civil Aviation; Group Captain P. W. S. Bulman, G.A.P.A.N.; Mr. W. S. Farren, Blackburn Aircraft, Ltd.; Sir Allen Gordon-Smith, S. Smith & Sons, Ltd.; Captain A. G. Lamplugh, British Aviation Insurance Co., Ltd.; Captain Neville Stack, Hunting Air Travel Ltd.; and Mr. C. O. Stanley, Pye, Ltd.



THE PASSENGERS: Brought over in the U.S.A.A.F. automatically controlled Skymaster, the flight personnel are (left to right) W/C R. Jeffs, James N. Anast (the engineer chiefly responsible for the development), Charles S. Franklin, Maj. T. F. Weldon, George B. Johnson, Capt. T. J. Wells, Col. J. M. Gillespie (flight commander), Capt. R. I. Whiting, and Sgts. W. W. McKie, R. Centollella, and J. C. Nimon.

AMALGAMATION OF B.E.A. DIVISIONS

THE announcement of an amalgamation of the English and Scottish Divisions of B.E.A. was followed last week by the resignation of Mr. G. Nicholson, manager of the Scottish Division. The Corporation explains that the amalgamation has been necessary to effect an economy in administration.

Both the English and Scottish Divisions were formed on February 1st this year and in the intervening period headquarter and maintenance bases have been set up at Speke and Renfrew. It is now intended to establish the combined administrative and maintenance headquarters staff at Renfrew. The date for such a move, or even for the amalgamation, has not been announced. Renfrew has apparently been chosen partly because of the large hangar space available for maintaining the fleet of aircraft, but accommodation for office personnel will undoubtedly present a problem. In addition, the airfield at Renfrew is small, and will require elaborate extension. The pooling of aircraft, however, will almost certainly effect an economy in operation. One cannot help feeling, however, that eight months of operation has been an expensive experiment.

AIR EVACUATION IN INDIA

AFTER receiving an urgent appeal on August 30 to transport 7,000 people from Delhi to Karachi, B.O.A.C. acted at once. Working in close co-operation with Scottish Airlines, Silver City Airlines and Westminster Airways, the first aircraft, a B.O.A.C. Lancastrian, reached Karachi the following day, while several other aircraft were on their way. On that day, however, the Pakistan Government cancelled their request, and all aircraft taking part in the operation were ordered to land pending further instructions. The cancellation instructions were subsequently rescinded, and B.O.A.C. carried on with the operation.

Aircraft detailed for the emergency operation were nine Dakotas, one York and one Lancastrian of B.O.A.C., five Dakotas of Scottish Airlines, three of Silver City Airlines, and two of Westminster Airways. B.O.A.C. also sent personnel to service the aircraft, operations officers to organize services, traffic officers to look after the passengers, and as many air crews as could be spared to ensure an almost non-stop shuttle between the two cities.

A. Cdre. H. G. Brackley, Assistant to the Chairman (Special Duties) of B.O.A.C., who in 1925 surveyed the flying-boat route across India, down to Singapore and on to Sydney, was in charge of the operations from the B.O.A.C. base in Delhi. He returned to the U.K. after the operations were concluded on September 17th.

RADIOLYMPIA 1947

THE fifteenth British Radio Exhibition, Radiolympia, opened in London yesterday, Wednesday, October 1st. The Exhibition, the first since the war, covers a comprehensive range of domestic and industrial radio embracing eight years of development and changes. There are four categories into which this year's Exhibition may be divided: Broadcasting and communications; television; electronics; and radar and navigational aids.

Many of the advances made in radio and radar during the war years are to be seen on the Exhibition stands. The Thomson Houston Company, for instance, are showing an electronic-amplidyne remote position-control servo mechanism similar to the controls which were used considerably in the war for the accurate positioning of guns and searchlights, and a device called the B.T.H. micro-wave detector of moving objects operated on the same principle as the proximity fuse which was used with spectacular success against flying bombs and other enemy targets. Mullard's stand in the National Hall has a complete range of silica transmitting valves specifically designed for industrial applications, and Marconi are exhibiting samples of direction finders, blind approach aids, lightweight communication equipment, and a lightweight airborne automatic direction finder for use in the air to give bearing indications from a selected station.

V.H.F. mobile equipment and a single frequency radio telephone unit designed for ground installation is to be seen on the Pye stand, and in the section devoted to the radio-engineering products of the General Electric Company there is displayed a wide range of communication equipment including a miniature airborne V.H.F. transmitter/receiver, a 1 kW transmitter, and the B.R.T. 400 communication receiver.

The Ministry of Civil Aviation is exhibiting for the first time and at their stand, designed by the Central Office of Information, the public have the opportunity of seeing an air traffic control room in action. M.F. direction-finding sets locate the position of aircraft in communication with the South-East Flight Information Region at Uxbridge, and air traffic clerks plot each aircraft with flags on a large map. The public can hear the R/T conversations of pilots landing at Heathrow, and among the other attractions is an airfield lighting panel co-ordinated with an illuminated diagram.

I.A.T.A. CONFERENCE

AS a result of the Annual Technical Conference of the International Air Transport Association which closed at Nice on September 12th recommendations for technical improvements

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in world airline services will be forwarded to the international organizations of airlines and to government aeronautical agencies. The Conference was divided into four working groups: Communications and Radio Aids (COM); Operations (OPS); Engineering and Maintenance (ENG); and Aids and Facilities (AIDS). Over a hundred outstanding technicians of twenty airline companies participated in extensive discussion of every phase of air transport engineering, including ground facilities, navigation and landing aids, communications, and operation and maintenance practices.

The chairman of the Conference was Mr. C. C. Eteensma, of K.L.M., who stated at the close of the meeting: "In ten days we have managed to make substantial further progress toward the world-wide uniformity and simplification of air transport practices which is the prime necessity for safe and efficient operation of the world air transport system."

Mr. C. H. Jackson, of B.O.A.C., chairman of the Engineering and Maintenance working group, said that his group reviewed a number of items of importance in relation to airworthiness and maintenance. Many recommendations were made to I.C.A.O. or to the member airlines, amongst which the following were of outstanding importance:—

(1) Procedure for the introduction of agreed corrections of local temperatures on aircraft performance, particularly at take-off.

(2) Improvements to the existing I.C.A.O. airworthiness regulations for the climbing performance of multi-engined aircraft with one engine inoperative.

(3) The limitation on the operating weights of aircraft which do not yet have to meet the I.C.A.O. requirement.

(4) The airworthiness requirements for cargo aircraft.

(5) The interchange of information on overhaul and maintenance experience between airlines using similar aircraft with a view to attainment of maximum safety and economy.

(6) The introduction of standards for servicing connections on aircraft; colour or other recognition codes for supplies and aircraft auxiliary systems; the international standardization of certain defined and rapidly consumable spares. Effective measures in this direction should lead to the pooling of ground equipment, etc., between operators and consequent increases in safety and economy.

THE MECHANIZATION OF METEOROLOGY

DELEGATES to the International Meteorological Conference at Toronto recently viewed demonstrations of electrically operated machines which record and tabulate meteorological data by means of "punch-cards." Such details as temperature, pressure, cloud cover, rainfall, windspeeds and direction are punched up on cards which are put through sorters, tabulators, collators, multipliers and verifiers to achieve the desired computation. Up to 480 cards per minute can be processed by these machines, which simultaneously tabulate and print the results.

Mechanical punch-carding results in considerable saving in time and cost. In addition, these machines have a practical application, enabling speedy decisions to be taken regarding distribution of produce and, as was done during the war, determining local conditions in particular areas.

Over the past sixty years the International Weather Bureau has collected one billion observations that will have to be punch-carded. The British Meteorological Office alone has some five million cards on file.

The International Meteorological Organization advocate the adoption of the same punch-carding methods by all countries to ensure uniformity and exchange of weather data.

A demonstration was given at Toronto of a type of chronometric telemetering automatic station consisting of instruments which register wind speed and direction and atmospheric pressure. The instruments are linked to an automatic radio transmitter powered by special storage batteries of the low-drain type, which sends three-hourly weather observations but which, under certain conditions, such as high wind speeds, automatically transmits hourly. Temperature and humidity reports and amount of precipitation can also be transmitted. Radio receiving units register these signals, which are recorded by meteorologists.

Automatic weather stations can operate ninety days without servicing, can be adapted for varying climatic conditions, and are a more economical proposition than meteorological observation stations in isolated districts. They proved invaluable during the war when, operating from enemy territory, they provided essential data for allied weather men.

The Commission on Maritime Meteorology is tackling such problems as marine climatology, the provision of weather reports, and the production of meteorological publications. An important item under consideration is the organization of an international scheme for the radio reception of coded reports from ships, which envisages improved methods of observation and the training of observers.

EFFECT OF TRAVEL BAN

REPRESENTATIONS have been made to the Bank of England by foreign airline companies in connection with the Government's new regulations restricting foreign travel. The restrictions, which come into force on October 1st, require business men to obtain permission prior to using the services of foreign companies. Foreign operators complain that such discrimination imposes an unfair restriction on services to this country. It is expected that the Bank of England will ask for some concession to be made, but if the regulations remain as at present planned, foreign countries will probably take retaliatory measures. Already the effect is evident in the restriction of the number of services by foreign operators for the winter. A.B.A., the Swedish airline, for example, who had planned to increase the present provision of 308 seats per week to 350 by placing Douglas DC.6 aircraft on the routes to the U.K., have now decided to fly only DC.3 aircraft and to provide only 33 seats.

MARINE BASE

THE Committee formed to inquire further into the establishment of a marine base for the U.K. have limited the final choice to three possible sites. One of the three is the site at Cliffe which was the second selection of the Pakenham Committee's original choice. The establishment of a marine base on this site would incur enormous expense, but it would be within easy reach of London and is served by adequate railway connections.

The other two possible sites are at Chichester Harbour, slightly east of the Pakenham Committee's first selection of Langstone Harbour, which, as in the case of the previous selection, would appear to be capable of being landlocked. Surface connections with London would be through either Chichester or Portsmouth. Presumably the Navy would raise no objections to a marine base in this harbour.

The third possible site is at the estuary of Blackwater River, with Maldon or Colchester as the nearest towns. Again the surface connections with London would be rather long and presumably through the main line to Colchester. The estuary however is wide and although on the north-eastern side of the industrial area would appear to be at sufficient distance to be free from bad visibility resulting from industrial haze.

THE WATCH COMMITTEE: At the first meeting of the Air Transport Advisory Council held in London on September 23rd (left to right): Mr. John Ure Primrose, Sir Donald Banks, Lord Terrington (chairman), Mr. G. S. Szlumper and the Hon. W. L. Runciman.

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BREVITIES

It is understood that a Miles Marathon will shortly be taken to New Zealand for demonstrations.

* * *

The direct Pan-American service between California and Hong Kong has been resumed. Three schedules in each direction will be run each week, two of which will be through Honolulu, Wake, Guam and Manila while the third will be through Honolulu, Wake, Tokyo and Shanghai.

* * *

The three Lockheed Constellations delivered to Aerlinte Eireann are to be named St. Patrick, St. Bridget, and St. Brendan.

* * *

Lord Brabazon has been re-elected President of the F.A.I. and M. Jean Bleriot has been appointed Secretary.

* * *

During July B.E.A. carried 69,602 passengers, an increase of more than 14,000 over the previous month. The number of services actually completed was 9,989. The total number of aircraft now in service in all divisions of B.E.A. is 90, and the route mileage is 16,548 miles.

* * *

The China National Aviation Corporation is facing a fuel shortage crisis. There has been no response from a request to the Chinese Government for an increased quota of high-octane petrol, and there is the possibility that many aircraft will be grounded.

Sudan Airways, which are operated on a management basis by Airwork, have introduced a weekly service between Khartoum, Malakal and Juba.

* * *

British South American Airways passenger aircraft are to be equipped with 16 mm projectors for showing films during flight. Non-inflammable films will be used.

* * *

In *Flight*, September 18th, it was erroneously stated that Mr. Kemp flew the Portsmouth Aerocar for the demonstration. It was, in fact, Mr. Alan Jones who demonstrated the aircraft during the whole of the air display at Radlett.

* * *

American Overseas Airlines have flown more passengers and operated more flights across the Atlantic in 1947 than any other airline. During the period 46,012 passengers, more than 500 tons of freight and 300 tons of mail have been carried.

* * *

Mr. B. T. Aikman, D.F.C., has resigned from the Lancashire Aircraft Corporation and leaves the Company at the end of the month. Mr. J. E. Rylands, Chairman and Managing Director of the Company, will take over all executive administrative work previously performed by Mr. Aikman, and A.V-M. H. H. McL. Fraser will resume his position as London Director when his present duties with the Board of Trade are completed. Mr. H. R. L. Smith remains as the Commercial manager for the company.

FROM THE CLUBS

AT White Waltham, where the West London Aeroplane Club is established, flying training progress has been well maintained during the summer, and the club's four instructors have been kept busy. In spite of maintenance difficulties arising from pressure of work, an average of 530 hours per month have been flown over the last four months. Besides aircraft of the B.E.A. Flying Club and the Household Brigade Flying Club, 32 privately owned machines are serviced and maintained at White Waltham, and the club's new chief engineer, Mr. F. Bevilacqua, has little spare time on his hands. A new clubhouse is nearing completion, and it is hoped to have this open in a few months' time and thereby to extend the social activities of the club. The aircraft hire service conducted with two Fairchilds has proved a popular amenity, and these aircraft have made numerous flights to the Continent during the summer. Incidentally, those people who have "laid up" their cars need not feel completely isolated from the White Waltham club; there is an excellent car hire service operating to and from the airfield.

YOUNG ENTHUSIAST: This photograph, taken at the meeting of the Bristol Gliding Club, shows 13-year-old Michael Hinton, the youngest holder of the R.Ae.C. "C" Certificate in this country, receiving final instructions from his father before taking off for a flight.

New Zealand flying clubs are viewing with grave concern the present attitude of Government-owned airlines towards private flying. Acting through the Government, the airlines have recently forbidden flying clubs to undertake charter flying of any description. Hitherto the clubs have been able to maintain a steady income from charter trips which helped to cut down the costs of private flying for club members, and it is feared that this latest move on the part of the airlines may prove a crippling blow to pleasure flying in New Zealand.

* * *

The London Aeroplane Club which, as we reported in *Flight*, July 11th, was taken over recently by the de Havilland Technical School, reports steadily increasing membership. The club lately broke its post-war record of monthly flying hours by completing 205 hours during the month of August in spite of the fact that two of its aircraft were undergoing C. of A. inspections and another was in for overhaul. Normally the club operates six aircraft—three Tigers and three Hornet Moths, which are in constant demand. The club is to keep open throughout the winter and it is hoping to extend its activities next summer.

* * *

To mark the completion of its first year of post-war operations the Bristol Gliding Club held an "At Home" on Saturday and Sunday, September 20th and 21st, at Lullsgate Airfield, where a large gathering of members and friends assembled for the occasion. There was a goodly collection of gliders and sailplanes at the meeting, and spectators were presented with an entertaining display of gliding and soaring and demonstrations of auto tows, winch launching and aero tows.

The Bristol Gliding Club is the first club in the country to benefit from the Lord Kemsley Fund, and one of the highlights of the meeting was the arrival by air in a Bristol freighter of Kirby Cadet and Tutor gliders acquired under the terms of the fund. The gliders had been flown from the Hooton factory, and within a short time of the freighter's arrival they were unloaded, rigged on the airfield and test-flown by club pilots. In an interview during the display Mr. Rex Young, chairman and C.F.I. of the club, stated that, having managed to exceed their target figure of 2,400 launches during the first year despite limited facilities, the club committee were confident that the new aircraft provided from the Kemsley Fund loan would enable the club to make further progress during the ensuing year of operations and to offer first-rate opportunities for motorless flight to all enthusiasts of the sport in the area.

It is interesting to note that more than 50 glider pilots have been trained by the Bristol Glider Club during the past year and the club is expecting to recruit over a hundred new members during the next year.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers not necessarily for publication, must in all cases accompany letters.

ENGINE ARRANGEMENT

Final Drive Not Differential

MAY I point out that the drawing which appeared with Mr. H. R. Barnard's letter (*Flight*, September 18th) is quite incorrect.

It purports to show two engines differentially driving one shaft, which in turn differentially drives two contra-rotating airscrews. Now if two similar engines drive one shaft, differential gearing is no advantage in normal conditions, and a great disadvantage if one engine fails—though free-wheel drive would be an advantage in that event.

Moreover, the differential gearing shown gives No. 1 engine a mechanical advantage over No. 2 engine, so that the engines could not deliver equal powers at equal speeds.

Differential drive to contra-props may be of benefit in achieving a perfect torque-balance, but the final drive shown is not in fact differential, though described as such in the lettering. The airscrews are each positively driven, in opposite senses certainly, but at invariably equal speeds. The bevel wheel at the bottom of the drawing is a "passenger" and plays no part in the train of gears. HUGH RYAN.

SAVING FOR A RAINY DAY

Dry Comment on the Use of Dry Ice

THE recent abortive attempt by Airwork, Ltd., to produce rain from suitable cumulus clouds, by introducing dry ice into them to provide nuclei for crystallization and the release of a corresponding amount of heat, was to anybody like myself, who holds dear the cause of individual effort and private enterprise, not a little disappointing. The spirit of the experiment was beyond reproach, the publicity seemed to be very well organized, but why was a day chosen when there were no suitable clouds south of 55 deg north?

Varying costs of the experiment were reported in the Press, all were in the hundreds of pounds however (the cost of several year's aero-tows for the Varsity Gliding Club), and yet a day was chosen when the official Met. Office forecast gave conditions unfavourable for the development of suitable clouds. If the experimenters had little faith in the Met. Office, which is still the best institution of its kind in the world, did they consult I.M.C O.S. the commercial meteorologists? If neither institution could be relied upon, a decision of their own could have been obtained by analyzing the upper air sounding for the day, which is issued by the Met. Office through Airmet on 1,200 metres, without so much as the cost of a wireless licence.

That someone in these days of excessive taxation can afford to get airborne for the sole purpose of throwing dry ice, costing several pence per lb, at any strato cumulus that has the misfortune to be at hand, is in itself, heartening.

I can only hope that my facts are wrong, or that the forecasts were misinterpreted, and I will persist in these hopes until such time as an official explanation for the take-off in such unfavourable conditions, comes to my notice. G. J. BELL.

ENGINE LIFE

Economical Cruising and Longevity

OF the many large aircraft piston engines in use today, there appears to be a great variation between types in the allotted span of running life expected and obtained before removal for overhaul and replacement.

The 1830/92 Twin Wasp is a notable performer in this respect and regularly completes 750 hours between overhauls with no trouble at all. This engine produces 1,050 b.h.p. at 2,550 r.p.m. up to 7,500ft. K for displacement in this case is 431, therefore, cruising at 600 b.h.p. and 1,800 r.p.m. then b.m.e.p = $\frac{600}{1,800} \times 431$ equals 143 b.m.e.p. which is very near the ideal for economical cruising with long life.

To cite another case, with a Hercules engine, should the pilot take 900 b.h.p. at 1,600 r.p.m. then we get $\frac{900}{1,600} \times 333$ and something over 180 b.m.e.p., which is much higher than the optimum figure. If K for the Merlin is 481 then this engine is using even higher b.m.e.p.s for cruising.

While the high boost and low revs' dictum is a very useful petrol saver, particularly in wartime, will it not also considerably reduce engine life and, if overdone on high efficiency engines, cause failure in some cases?

This letter is written in the hope that the experts will give some enlightenment in your columns, even though the writer who may be classed as an amateur gets shot down alight in the process. "SPANNER PULLER."

HEINKEL 113

Did it Ever Exist ?

READING your criticism of Air Commodore E. L. Howard-Williams' new book, *Immortal Memory*, I was interested in your critic's comments on the Heinkel He. 113. There is still some considerable mystery concerning this machine. Jane's *All the World's Aircraft* (1940), quoting technical data on German aircraft from Air Ministry figures (pages 68-69c) gives some illuminating figures for a machine of this designation, as does Jane's for 1941, and Mr. C. G. Grey on page 238 in his book *The Luftwaffe*.

If, as your critic suggests, there never was such a machine, on what does he base his assumption——that it was in fact the He. 100, a machine which presumably preceded the He. 112 (which fought in Spain) and from which the "113" was supposed to have been developed? As the "112" fought in Spain, how can the "113," which was developed from it, have, in reality, an earlier designation when it came about three years later? The Dornier 211 is certainly fabulous.

The more surprising, however, was his remark that the veracity of the author's friend's statement, that at one time no fewer than eight German aircraft wrecks lay within one mile of her house, should be "strongly questioned." One wonders why. To those who lived in south east Kent during the Battle of Britain the euphemism seems rather uncalled for, to say the least. Within one mile of this modest hamlet, there were, both on the surface and well beneath, at one time, no fewer than fifteen wrecked aeroplanes, all victims of the Battle of Britain. They were: eight "Spits," three "109s," a Hurricane, an "88," a Heinkel He. 111, and a Dornier Do. 17z. I kept at the time most careful records of these crashes and they may be seen and verified. Moreover the Returns of the Local Authorities to the County Civil Defence Dept., H.Q., give, for the period of the whole war, a total of 45 *enemy* aircraft as having crashed in the local R.D.C. area, and a total of no fewer than 374 enemy aircraft alone as having crashed in the S.E. Region of Kent.

These figures may give some idea to your critic as to the state of affairs in rural Kent in the summer of 1940, and they may be checked at County Hall, Maidstone, or with a spade, plough or pick round the fields of Kent.

IAN H. C. FRASER.

[*Mr. H. F. King, of our editorial staff, who wrote the criticism of "Immortal Memory," is at present making a tour of the French aircraft industry. Doubtless, on his return, he will reply to Mr. Fraser's letter.*—ED.]

FORTHCOMING EVENTS

Oct. 9th.—Royal Aeronautical Society: "Pressurisation of Aircraft." W. M. Widgery, F.R.Ae.S.

Oct. 19th to Nov. 24th.—Royal Aero Club of Belgium: Air rally to the Belgian Congo. Brussels to Le Kivu.

Oct. 21st.—R.AeS. (Graduate and Student). "Interplanetary Flight and Rocket Propulsion." A. V. Cleaver, A.F.R.Ae.S.

Oct. 23rd.—Royal Aeronautical Society: "The Problem of High Temperature Alloys for Gas Turbines." Sir William T. Griffiths, D.Sc., F.R.I.C., F.Inst.P., F.I.M.

Oct. 30th.—Royal Aeronautical Society: Third British Commonwealth and Empire Lecture. Mr. James Bain.

Nov. 1st.—Society of Licensed Aircraft Engineers: "Aircraft Pneumatics." H. R. Haerle.

Nov. 4th.—R.Ae.S. (Graduate and Student). "Maintenance Difficulties in the Field." M. J. Kemper, M.B.E., A.R.Ae.S.

Nov. 6th.—Royal Aeronautical Society." Some Recent Developments in the Landing Gear Field." Capt. R. Lucien, A.F.R.Ae.S.

Nov. 19th.—R.Ae.S. (Graduate and Student). "Aircraft Photography." John Yoxall.

Nov. 20th.—Royal Aeronautical Society: Joint Lecture with Inst. Mechanical Engineers. "The Development of the A.S. Type Gas Turbine." W. H. Lindsey, M.A., A.F.R.Ae.S.

Dec. 4th.—Royal Aeronautical Society: "Problems Facing Civil Airline Operators." N. E. Rowe, C.B.E., B.Sc., D.I.C., F.R.Ae.S.

SERVICE AVIATION

LONGSTOP II: Transport Command Yorks taxying into position for unloading at the Mobile Staging Post demonstration at Brize Norton airfield last week.

Royal Air Force and Naval Aviation News and Announcements

The King Air Commodore-in-Chief R.A.F.R.

HIS MAJESTY THE KING has been graciously pleased to accept the position of Air Commodore-in-Chief of the Royal Air Force Regiment.

The position which the King has now assumed resembles closely those positions held by His Majesty in relation to certain corps of the Army. The organization of the Royal Air Force, apart from the R.A.F. Regiment, does not lend itself to the creation of separate corps and no part of it until now enjoyed this honour. His Majesty is, however, the Air Commodore-in-Chief of the Auxiliary Air Force and of the Air Training Corps.

Appointments

THE Air Ministry announces the following appointments in the Royal Air Force:—

Air Marshal Sir Hugh W. L. Saunders, K.B.E., C.B., M.C., D.F.C., M.M., to be Air Council Member for Personnel; A.V-M. Sir Hugh P. Lloyd, K.B.E., C.B., M.C., D.F.C., to be Air Commander-in-Chief, Air Command, Far East, and is granted the acting rank of Air Marshal; A.V-M. Sir Arthur P. M. Sanders, K.B.E., C.B., to be Air Officer Commanding-in-Chief, British Air Forces of Occupation (Germany), and is granted the acting rank of Air Marshal and A.V-M. A. B. Ellwood, C.B., D.S.O., to be Air Officer Commanding-in-Chief, Bomber Command, and is granted the acting rank of Air Marshal.

Air Marshal Sir Hugh Saunders has been A.O.C.-in-C., Bomber Command, R.A.F., since January 16, 1947, prior to which he was A.O.C., R.A.F., in Burma from August, 1945.

Since November 15, 1945, A.V-M. Sir Hugh Lloyd has been R.A.F. Instructor at the Imperial Defence College, prior to which he was A.O.C. Very Long Range Bomber Force from April, 1945.

A.V-M. Sir Arthur Sanders has been in the Department of the Assistant Chief of Air Staff (Training) for duty with the Committee for Revision of R.A.F. Manuals.

A.V-M. Ellwood has been a Director-General of Personnel, Air Ministry, since August, 1945. He was formerly Senior Air Staff Officer at H.Q., Coastal Command.

WITH HIS SQUADRON: Air Comdre. Winston Churchill, Mrs. Churchill and Air Comdre. Sir Harry Broadhurst at Biggin Hill airfield for the Battle of Britain "At Home."

Other appointments announced were: A.V-M. Anthony Lauderdale Paxton, C.B., C.B.E., D.F.C., to be Director-General of Personnel II, Air Ministry; A.V-M. Charles Basil Slater Spackman, C.B.E., D.F.C., to be Senior Air Staff Officer, British Air Forces of Occupation, Germany, and A.V-M. Ronald Ivelaw-Chapman, C.B.E., D.F.C., A.F.C., to be Royal Air Force instructor at the Imperial Defence College.

Since May of this year A.V-M. Paxton has been Senior Air Staff Officer, British Air Forces of Occupation, Germany, and was formerly Air Officer Commanding No. 2 Group, B.A.F.O., from June, 1946. Previously he was A.O.C. No. 85 Group.

A.V-M. Spackman has been Air Officer Commanding No. 19 Group, Coastal Command, since September, 1945, and for two years previously he was Air Officer in charge of Administration at Fighter Command headquarters after having been Deputy A.O.A. there for eight months.

A.V-M. Ivelaw-Chapman has been serving with the Defence Research Policy Committee since November of last year and was formerly Air Officer Commanding No. 38 Group, Transport Command.

Admiralty Appointment

CAPTAIN W. G. ANDREWS, C.B.E., D.S.O., R.N., who has commanded two of Britain's largest Aircraft Carriers, H.M.S. *Formidable* and H.M.S. *Indomitable*, is to be senior naval member of the directing staff of the Imperial Defence College. He will succeed Rear Admiral the Hon. Guy H. E. Russell, D.S.O.

Armament Lincoln for U.S.A.

A LINCOLN II of the R.A.F. Empire Air Armament School, Manby, Lincs, left Prestwick at midnight on September 28th for a liaison flight to U.S. Army Air Force stations in the U.S.A. and Royal Canadian Air Force stations. Captained by W/C. C. T. Weir, D.F.C., the aircraft carried an armament training team led by A. Cdre. H. D. Spreckley, O.B.E.

Service Aviation . . . . .

The team includes W/C. D. E. B. Wheeler, D.F.C., of the Department of the Assistant Chief of Air Staff (Training), who will advise on the current trend of armament development in U.K. The aircraft will fly out via Goose Bay to the R.C.A.F. station at Ottawa. During October it will visit some ten U.S.A.A.F. stations and training establishments. It will then return to Ottawa on November 1st, after which it will visit the R.C.A.F. Unit at Goose Bay and make, it is hoped, an additional call at Trenton, Toronto, before leaving for Prestwick.

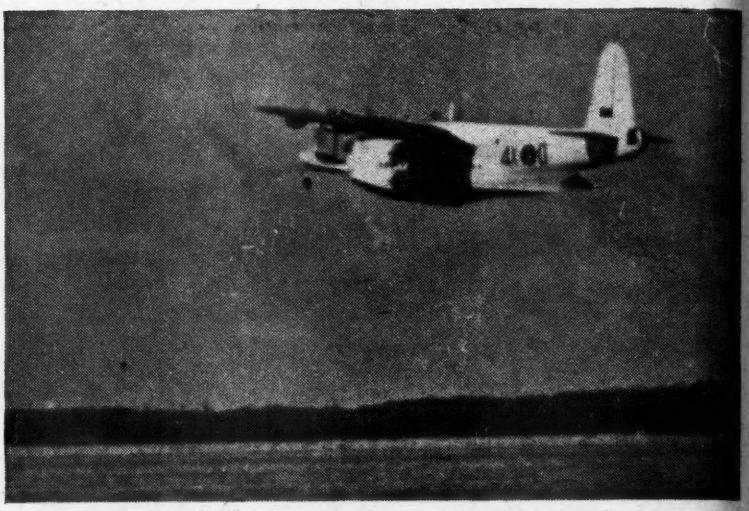
R.A.F. College—Autumn Sports Fixtures

THE following are sports fixtures for the R.A.F. College, Cranwell: *Rugger:* R.A.F. XV, home—December 3rd; Royal Military Academy, home—December 13th. *Soccer:* Royal Military Academy, away—November 25th. *Fencing:* Royal Military Academy, away—November 25th. *Squash:* Royal Military Academy, away—November 25th.

W.A.A.F. Staff Conference

THE conference of W.A.A.F. Staff Officers at Westfield College, London, was opened on September 18th by the Chief of the Air Staff, Marshal of the Royal Air Force Lord Tedder, who emphasized that air forces and air power were the first line of defence of this country and that the R.A.F. included the W.A.A.F. He paid tribute to the W.A.A.F. personnel who during the war had often insisted on staying on duty in half-wrecked buildings and in some instances had set an example to the men themselves. Lord Tedder said that the W.A.A.F. would be an essential part of the Air Force of the future and could be a stabilizing and steadying influence on the Services as a whole, and, therefore, had a tremendous responsibility to the R.A.F.

The conference discussed prospects of employment for women in technical trades. During a discussion on accommodation of the future, Wing Officer Lady Seton said that while building programmes could not be put in hand until there was a general improvement in the national housing situation, she encouraged the officers with her picture of the future intentions of the Royal Air Force towards its Service men and women. She also referred to the emphasis being laid on privacy, individuality and recreational club facilities within the W.A.A.F.



FOR NORTHERN WATERS: One of the Sunderlands of No. 230 Squadron gets away for the Scandinavian tour. The first stop was Stavanger in Norway.

Scandinavian Cruise by Sunderlands

IN response to an invitation from the Norwegian and Danish Governments to R.A.F. Coastal Command to visit Norway and Denmark as their guests, three Sunderland Mark Vs of No. 230 Squadron (S/L. G. A. Huxford) left R.A.F. Station, Calshot, on September 22nd for a week's cruise of Scandinavia. Air Marshal Sir Leonard Slatter, Air Officer commanding-in-Chief, Coastal Command, flew in one aircraft, and the mission was led by W/C J. L. Crosbie.

The captains of the three Sunderlands were the Squadron Commander, S/L. G. A. Huxford, F/L. A. E. Harkness and F/L. R. G. Stanford.

R.A.F. Horticultural Show

THE Royal Air Force annual horticultural show will be held in the Royal Horticultural Society's Hall, Vincent Square, Westminster, on Wednesday, October 1st. It will be open free to members of the R.A.F. between 2 and 6.30 p.m. and to the general public after 4 p.m. All R.A.F. Stations having unit gardens will send exhibits of vegetables and some will send fruit. The first prize, for a collection of twelve varieties of vegetables (not less than six kinds), will be the Royal Horticultural Society's silver challenge cup, which will be held by the winning station for a year. The R.A.F. Unit Gardens Trophy, for the best garden judged from the airmen's messing point of view, will also be presented during the show. It has been won this year by R.A.F. station Cosford, with H.Q. Unit, Bomber Command, and R.A.F. Hospital, Wroughton, as close runners-up for second and third places. The presentations will be made by the Marchioness of Carisbrooke, who will be introduced at 3 p.m. by Marshal of the R.A.F. Lord Tedder.

ON GOODWILL TOUR: The aircrews who manned the three Sunderlands of No. 230 Squadron which recently left Calshot for a goodwill tour of Scandinavia.

Reunions

THE 205 Group Reunion Party (second year) will be held on Saturday, November 1st, at the Surrey Tavern, Oval, London. Admission by ticket only (5s) from the Secretary, 6, Northbourne, Hayes, Bromley, Kent.

* * *

The R.A.F. Escaping Society will hold a reunion dance at 7.30 p.m. on Saturday, October 11, at Bush House Restaurant, Strand, W.C.2. The R.A.F. dance orchestra will be in attendance. Tickets, 8/6 single or 15/- double, buffet included, may be obtained by members from the Secretary, R.A.F.E.S., Room 743, Adastral House, Kingsway, W.C.2.

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A reunion of No. 125 Squadron will be held on November 15th. Apply to J. P. Cole, 191, Farleigh Road, Warlingham, Surrey.